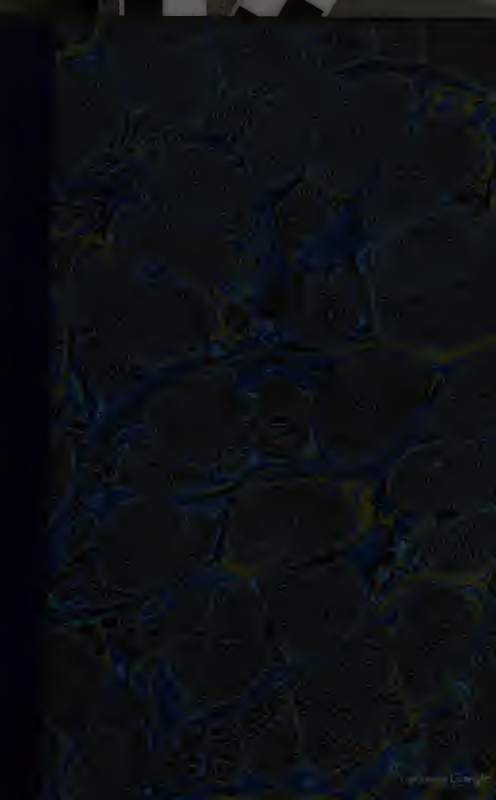




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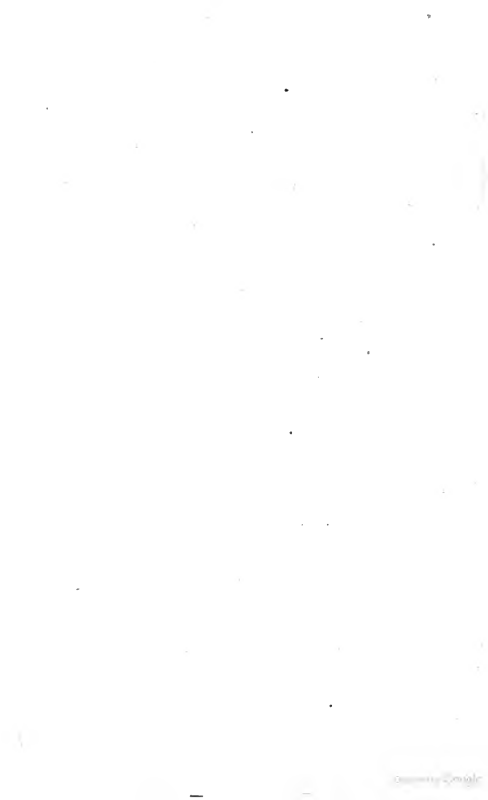
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THE  
RURAL ECONOMY  
OF  
GLOCESTERSHIRE;

INCLUDING ITS  
*D A I R Y*:  
TOGETHER WITH THE  
*DAIRY MANAGEMENT*  
OF  
NORTH WILTSHIRE;  
AND THE  
*M A N A G E M E N T*  
OF  
*ORCHARDS and FRUIT LIQUOR,*  
IN  
HEREFORDSHIRE.

---

BY MR. MARSHALL.

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IN TWO VOLUMES.  
VOL. II.

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GLOCESTER:  
PRINTED BY R. RAIKES,  
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M. DCC. LXXXIX.





# C O N T E N T S

## T O T H E

### S E C O N D V O L U M E.

|                                                                                      | Page         |
|--------------------------------------------------------------------------------------|--------------|
| <b>PREFATORY OBSERVATIONS</b> - - -                                                  | 1            |
| <b>COTSWOLD HILLS</b> described - - -                                                | 5            |
| <b>Their RURAL ECONOMY</b> registered under                                          |              |
| 1. Estates - - - 12                                                                  | 47           |
| 2. Man. of Estates 13                                                                | 48           |
| 3. Farm Buildings - 16                                                               | 49           |
| 4. Drinking Pools - 21                                                               | 50           |
| 5. Fences - - - 23                                                                   | 50           |
| 6. Woodlands - - - 25                                                                | 58           |
| 7. Planting - - - 25                                                                 | 60           |
| 8. Farms - - - 27                                                                    | 63           |
| 9. Farmers - - - 29                                                                  | 74           |
| 10. Workmen - - - 29                                                                 | 74           |
| 11. Beasts of Labour* - 29                                                           | 75           |
| 12. Implements - - - 35                                                              | 79           |
| 13. Managt. of Farms 36                                                              | 81           |
| 14. Course of Husbandry 37                                                           | 81           |
| 15. Soils and Managt. 38                                                             | 82           |
| 16. Manures and Man. 47                                                              | 82           |
| 17. Harvesting .. 48                                                                 |              |
| 18. Farmyard Man. 49                                                                 |              |
| 19. Markets - - - 50                                                                 |              |
| 20. Wheat - - - 50                                                                   |              |
| 21. Barley - - - 58                                                                  |              |
| 22. Turneps - - - 60                                                                 |              |
| 23. Cultivated Herbage 63                                                            |              |
| 24. Grassland - - - 74                                                               |              |
| 25. Horses - - - 74                                                                  |              |
| 26. Cattle - - - 75                                                                  |              |
| 27. Sheep - - - 79                                                                   |              |
| 28. Swine - - - 81                                                                   |              |
| 29. Rabbits - - - 81                                                                 |              |
| 30. List of Rates - - - 82                                                           |              |
| <b>VALE OF BERKELEY</b> described - - -                                              | 85           |
| <b>Its RURAL ECONOMY</b> registered, so far as it relates to the following subjects: |              |
| 1. Estates - - - 89                                                                  | 93           |
| 2. Farms - - - 90                                                                    | 94           |
| 3. Soils - - - 92                                                                    | 98           |
| 4. Water - - - 93                                                                    |              |
| 5. Herbage - - - 94                                                                  |              |
| 6. Cows - - - 98                                                                     |              |
| 7. DAIRY MANAGEMENT - - -                                                            | 103          |
|                                                                                      | <u>NORTH</u> |

NORTH WILTSHIRE described - 140Its RURAL ECONOMY registered, so far as it relates to

|            |   |     |            |   |     |
|------------|---|-----|------------|---|-----|
| 1. Estates | - | 143 | 4. Water   | - | 150 |
| 2. Farms   | - | 145 | 5. Herbage | - | 150 |
| 3. Soils   | - | 147 | 6. Cows    | - | 151 |

7. DAIRY MANAGEMENT - 155GENERAL OBSERVATIONS on DAIRY MANAGEMENT - 183HEREFORDSHIRE described - 221Cattle of Herefordshire - 226Sheep of - 233ORCHARDS and FRUIT LIQUOR, Herefordshire and Gloucestershire - 239Management of Orchards - 243Management of Fruit Liquor - 303GENERAL INDEX

THE

THE  
RURAL ECONOMY  
OF  
GLOUCESTERSHIRE, &c.

**I**N YORKSHIRE, the more immediate vicinity of the STATION, affording an ample supply of important information, the EXCURSIONS were necessarily few, and short. Here, on the contrary, the district of the STATION being less fertile in useful ideas on the subject of these registers, the excursions have been more numerous, and made with greater deliberation.

VOL. II.

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In

In the present instance, EXCURSIONS were in a degree necessary. The district of the STATION, though evidently the best I could have chosen for the general purpose, was not in itself equal to it. The subject DAIRY-MANAGEMENT must have been left in a state of obscurity had not the practices of the VALE OF BERKELEY, and NORTH-WILTSHIRE, been added to that of the VALE OF GLOCESTER; nor could the subject FRUIT-LIQUOR have been fully explained, without the practice of HEREFORDSHIRE.

The COTSWOLDS, having no immediate alliance to the district of the station, with regard to rural practice, might certainly have passed as an INTERMEDIATE DISTRICT. But viewing them as the second tract of calcarious hill which the island possesses; and seeing the spirit of improvement which has been of late years diffused over them; considering, at the same time, the near connexion they have with the district of the station, in regard to contiguity of situation; and that I might not have them a second time within my reach,—it  
would

would have been wrong to have neglected so fair an opportunity ; especially as I foresaw that, with a little exertion, I should, nevertheless, be able to compass the other objects I had in view.

The following account, of the rural practice of these hills, is offered as the produce of an EXCURSION ; not as that of a TWELVE MONTH'S RESIDENCE. In May, 1788, I spent a week in the center of the district ; and have been, at other times, over different parts of it. My first object was to gain an adequate knowledge of the district, and its general management as they appeared to the eye at the times of survey: the next, to take a deliberate view of the largest and best managed farm it contains: the last, to converse with professional men upon the subject: digesting the useful ideas, as they rose, in a systematized register, previously opened for the purpose. All I have to say farther is, that, since the account has received its present form, it has been seen and approved, by those who are best able to form an adequate judgement of the subject.

It might be sufficient to mention the name of Mr. PEACEY of NORTHLEACH; a man whose superior management has spread his name and character over *this* district *at least*: I will, however, add that of Mr. JOHN CRADDOCK of the same place.

THE



# T H E

## W O L D S

### O F

## G L O C E S T E R S H I R E.

THE SITUATION of the **COTSWOLD HILLS** has been given. Their **OUTLINES** is irregular. Their **EXTENT**, from **Broadway Hill** to near **Tetbury**, thirty miles; — from **Birdlip Hill** to **Burford** about twenty miles: containing upward of 300 square miles, or about 200,000 acres.

The **SURFACE** billowy: the style of hill somewhat similar to that of the wolds of **Yorkshire**; but less magnificent: the vallies are narrower, and the hills, especially toward the western margin, sharper; more in the mountain style, than those of the **Yorkshire**

wolds. As subjects of RURAL ORNAMENT, they are of course susceptible of great beauty.

The CLIMATE of the Cotswold hills, when we consider their natural elevation and their present nakedness, is unusually mild. I found vernal vegetation, in May, nearly as forward in the center of this highland district, as in the richer warmer lands in the neighbourhood of Gloucester.

It is however remarked by men of observation, that these hills vary much as to their natural warmth. Spring snows are observed to pass off some of them much quicker than others. This is an evidence that climate depends on *soil*, or on something which is beneath the soil, rather than on what is generally termed *air*. The atmospherical air is in almost continual circulation, and cannot be liable, in the distance of a few furlongs, or perhaps a few yards, to any other specific difference than that which is communicated by the soil over which it circulates, or upon which it may chance to rest. Hence (by the way) the insalubrity of air stagnant on ungenial soils: and hence, perhaps, the insalubrity of easterly winds; which, travelling over an extensive tract

tract of continent—*land*—and having in its passage received the communications of soils less genial (to our acquired habits at least) than our own,—become, here, injurious; not only to the animal, but to the vegetable kingdom.

In WATER, the Cotswold hills, considering their height, are singularly happy. Almost every dip has its rill, and every valley its brook. The sides of the hills abound with springs; and even on the highest swells, water generally lies within the reach of a pump. Benefits, those, with which few hill countries are blessed.

The SOIL, generally, a calcarious loam: mostly mixt with gravel and small stones: provincially “stone brash.” But the soil varies much: in some places it inclines to a lightish loam, (a kind of soil common on cultivated hills.) In others—and most generally—it is of a binding tenacious quality; baking with drought, and clinging to the feet in wet weather. And in some places, especially on the hangs of hills, it is of a strong clayey nature. It may in general be called tolerable TURNIP AND BARLEY LAND. Here and there, but not often I apprehend, it comes within the idea of

WHEAT LAND. The *depth* of soil little:—four to six inches:—five inches may, I apprehend, be considered as the full depth, on a par of the Cotswold hills.

The SUBSOIL most prevalent is a *calcareous rubble*: namely, small stones mixt with a grey crumbly mould, full of efflorescent matter. In some places a *calcareous rock* rises to the soil: and in others, a strong *loamy earth* intervenes between the soil and the rubble.

The SUBSTRUCTURE, or natural MATERIALS of which these hills are composed, can only be guessed at. Stone is found almost everywhere near the surface. Fine quarries of calcareous granite are worked as freestone, for troughs and for building materials. Beds of clay are here and there found; and a fine jam of clay marl has lately been discovered. From these circumstances, and from the sides of the hills abounding with springs, it seems probable that the matter of which these hills are composed is an irregular mixture of *retentive earth* and *rock*.

ROADS are made across these hills with singular facility. Pits are dug by the side of them, and the stones wheeled on, in barrows. The materials, however, are more plentiful than

than durable: presently grinding down under heavy carriage. But the repairs are equally easy as the forming.

This method of making and repairing roads is a great saving of team-labour; but it has its evil attendants. The pits are unsightly; and though not very deep, are nevertheless dangerous. But the greatest evil which strikes me is that of their destroying the SIDE ROADS, which every wide lane ought to have, for summer travelling. Were a small share of attention paid to the side slips in this and many other districts, the REPAIRABLE ROAD would lie in a state of disuse six months in the year. It appears extraordinary that the superintendants of road should continue blind to this improvement. A very considerable proportion of the expence which is at present bestowed on the roads of this kingdom might, I am fully convinced, be saved by a due attention to the waste grounds on the sides of them.

INCLOSURE. Thirty years ago, this district lay almost entirely in an open state;—namely in arable common field, sheep-walk, and cow-down. At present, it may be said  
to

to be in a state of inclosure; though some few townships yet remain open.

The difficulties of inclosure were not, in this case, numerous, or great. The sheep walks and cowdowns were all of them stinted by "yard lands" in the arable fields: there was not, perhaps, one unstinted common on these hills. A circumstance somewhat singular. It is not, however, the only remarkable circumstance belonging to the Cotswold townships. They were, formerly, many of them, or all of them, occupied by leasehold *tenants* for three lives renewable. A species of *tenancy* I have not met with before. Many of these leaseholds had fallen in. The removal of those which remained, was the main obstacle of inclosure.

The effects of these inclosures, notwithstanding the land was appropriate in the open state, were very beneficial. The *arable* land in the open state was of little value. The improvement of this has been at least three fold. This improvement has been chiefly affected by turneps and the cultivated grasses. In the open state, sheep were only *bred*: now the  
the

the Cotswold sheep may rank among the first in Smithfield market.

Under the Cotswold inclosures, the tithes of the respective townships were set out, in land: a circumstance which aided much in the improvements which have taken place. The proportion was unusually high: in some cases, one fifth of the arable, and one ninth of the grass lands of the township: but the privilege of laying down so intolerable a burden, as that of tithes, in an arable country, can scarcely be purchased too dear.

PRODUCE. This is, in the strict sense of the phrase, an *arable country*. Corn, turneps, and cultivated herbage, occupy, perhaps, nine tenths of its surface. Some little *sheepwalk* and *cowdown* still remain; and the bottoms and sides of some of the deeper vallies are in a state of *meadow*;—provincially “English grass.” There are also some patches of *woodland* scattered among these hills: one of them (in Chedworth) large—a thousand acres.—But in general the country is bare, much too bare, of wood. A circumstance, which those who have no property in it can only regret.

But

But utility and ornament call equally loud on those who have, to cover its present nakedness. What a lovely passage of hill country lies above Dowdswell. Almost every other part of these hills is capable of being rendered equally beautiful.

Viewing the Cotswold hills as a subject of RURAL ECONOMY, it will be proper to consider separately the following particulars.

|                            |                             |
|----------------------------|-----------------------------|
| I. ESTATES.                | XVI. MANURE AND MANAGEMENT. |
| II. MANAGEMENT OF ESTATES. | XVII. HARVESTING.           |
| III. FARM BUILDINGS.       | XVIII. FARMYARD MANAGEMENT. |
| IV. DRINKING POOLS.        | XIX. MARKETS.               |
| V. FENCES.                 | XX. WHEAT.                  |
| VI. WOODLANDS.             | XXI. BARLEY.                |
| VII. PLANTATIONS.          | XXII. TURNEPS.              |
| VIII. FARMS.               | XXIII. CULTIVATED HERBAGE.  |
| IX. FARMERS.               | XXIV. NATURAL GRASSLAND.    |
| X. WORKMEN.                | XXV. HORSES.                |
| XI. BEASTS OF LABOUR.      | XXVI. CATTLE.               |
| XII. IMPLEMENTS.           | XXVII. SHEEP.               |
| XIII. MANAGEMENT OF FARMS. | XXVIII. SWINE.              |
| XIV. COURSE OF HUSBANDRY.  | XXIX. RABBITS.              |
| XV. SOIL AND MANAGEMENT.   | XXX. LIST OF RATES.         |

I. ESTATES. Landed property is here in a few hands. Estates mostly large. The yeomanry inconsiderable. The CHEDWORTH and the SHERBORNE estates stretch across the center



center of these hills, and include no inconsiderable part of them. Lord BATHURST has some estate about his residence near Cirencester. Several gentlemen have likewise residences, and considerable estates belonging to them, in different parts of the district. The *off* estates, I believe, are not numerous nor great. The Cotswolds are, or might be made, a delightful land to *reside* in.

TENURES. Mostly *fee simple*. Some *College leasehold*, of 21 years renewable. Little or no *copyhold*.

## II. MANAGEMENT OF ESTATES.

1. MANOR COURTS. Before the inclosures took place, courts were held; chiefly for the regulation of the stinted grass lands, and the well ordering of the leasehold tenants. But commons being done away, and the leasehold tenancy becoming extinct, with the inclosure, the manor courts have, in consequence, fallen into disuse. - A circumstance, which the country may have reason to regret.

2. TENANCY. Notwithstanding the inclosures, and the subsequent improvements requisite

requiſite to be made, the principal part of the tenants remain *at will*.

This might be uſed as an argument, that *leaſes* are unneceſſary to ſpirited improvements. But it is proper to be known, that the more ſtriking improvements have been made under *leaſe*; and that the ordinary improvements, which have been made by tenants at will, have been made under *confidence* in the landlord.

The diabolical ſpirit of over-renting has not yet got poſſeſſion of the owners of theſe hills, and as the eyes of men of landed property begin to open on the folly of deranging their eſtates by exceſſive rents, which they find can only be temporary, the neceſſary confidence between landlords and tenants at will, may ſtill remain unbroken on the Cotſwold hills: nevertheless, in a country where faintfoin is the farmer's ſheet anchor, it is well underſtood, and is indeed ſelfevident, that leaſes are eſſential to ſpirited improvement. For though a general ſpirit of oppreſſion may not take place, *miſunderſtandings* cannot always be avoided. A leaſehold tenant improves with a degree of *certainly*, which gives vigour to his

his efforts: a tenant at will, with a degree of *bazard*, which damps every intention as it rises; and totally discourages him from attempting the HIGHER STAGES OF IMPROVEMENT.

Most of the *larger* farms, I understand, are under leases of seven, fourteen or twenty one years. Fourteen years appear to be a satisfactory term.

3. RENT,—of the open townships 2s. 6d. to 5s. an acre, subject to tithe: of the inclosed lands 6s. to 12s. an acre, tithe free.

4. RECEIVING. The times and mode vary on different estates. The prevailing times are midsummer and Christmas; giving the tenants nine months credit.

5. REMOVALS. Chiefly Ladyday. Fortunately for the country, the business of removal seems to be little understood. If the farm be let in time, the oncoming tenant sows wheat and spring crops; if not, they probably go unsown; the outgoing tenant quitting every thing at Ladyday; except, perhaps, the barns, which he occupies till Midsummer. How much more beneficial to an estate and the community, when the outgoing

going tenant continues to cultivate the farm, until the day of removal; the landlord, or incoming tenant, allowing him the estimated value of the crops, herbage, and fallows, which are left. (See NORF: ECON: i. 79.)

6. COVENANTS. *Buildings* are erected and repaired by the landlord. *Fences* kept up by tenant, who is generally allowed to lop and crop *bedge timber* (if any upon his farm) and to sell *wheat straw*; even in the center of the hills.

### III. FARM BUILDINGS. I. MATERIALS.

THE WALLING MATERIALS are invariably *stone*.  
TIMBER, chiefly *oak*. COVERING, *slate*.—  
FLOORING, *stone, oak, deal*.

Rough stones for ordinary building are usually raised by the perch of wall. The price 5d. to 8d. a perch of  $16\frac{1}{2}$  square feet (that is a perch long and one foot deep) for a wall 24 inches thick. This is an unusual, but an accurate mode of raising them. The variation of price is caused by the nature of the quarry.

The price of oak timber in the stick is. to 15d. a foot. Plenty to be had at this price. A striking evidence, that a small quantity of woodland

woodland is sufficient to supply the *inland* demand for timber. The carriage, however, is to be added to the above price.

The slates (of a stone-colour) are raised in different parts of these hills. The price upon the roof—plaistering beneath included—about 26s. a square (of 100 square feet).

Farm kitchens and lower rooms, in general, are laid with dressed stone. The price upon the ground complete 4½d. a foot.

CEMENT. Lime is excessively dear; and sand not to be had, I believe, at any price; nevertheless an excellent mortar is here prepared at a moderate expence.

Invention is seldom more successful, than when necessity prompts it. The scrapings of the public roads; namely levigated lime-stone, impregnated more or less with the dung and urine of the animals travelling upon them; are found to be an excellent basis for cement. For ordinary walls the scrapings, alone, are frequently used. And from what I can learn, the proportion for the best building is not more than one part lime to three of scrapings. Nevertheless I found mortar, which had not lain in the walls more than ten years, of a  
 Vol. II. C stonelike

stonelike tenacity: much firmer than the ordinary stone of this country: probably much *harder* than either of the stones, from which the basis or the lime was made. Similar scrapings might be collected in any district, where limestone is used as a material of roads.

The method of PREPARING this CEMENT is simply that of collecting the roadscrapings, flaking the lime, mixing them intimately together, and, as the mass is worked over, carefully picking out the stones, or other foulness which may have been collected.— This, for stonework, is found sufficient: for brickwork, however, it might be necessary, that the materials should pass through a skreen or sieve; previous to their being made up.

The price of lime, here, 8d. a bushel of eight gallons, level. The price of coals about 30s. a ton. The kilns small, *with funnel tops*; to carry off the smoke, and, it is said, to give a more regular draught.

2. FARMERIES. I found nothing strikingly new in the buildings and farm yards of the Cotswold Hills: except that I here met with another GRANARY OVER A BARN FLOOR\*;—  
the

\* See YORKS: ECON: i, 131.

the height about ten feet (just out of the reach of the flail); and with two instances of GRANARIES OVER PITCH-ROOF PORCHES; a new idea, and a very good one. The corn is hoisted up by tackle; and shot down through *canvas tunnels* into bags placed below.

The size of BARNs, in this country, is above par. In height, above any I have observed. Fifty two by twenty feet in the clear, and sixteen to twenty feet high to the plate, is esteemed a good barn. This size admits of four bays of ten feet each, with a floor in the middle. There are some remains of old monastery barns, of great size, in this district.— The height of modern barns may have arisen from observing in those that “one foot below the beams is worth two above.”

BARN FLOORS are of a good size: 12 to 14 by 18 to 20 feet. The best of *oak*: some of *stone*: but a species of *earthen floor* which is made, here, is thought to be superior to floors of stone, or any other material, except found oak plank. The superior excellency of these floors is owing in part to the materials of which they are made; and in part to the method of making.

The materials are the calcarious earth of the subfoil ;—a kind of ordinary gravel which is found in different parts of these hills ; and the chippings of freestone (calcarious granite) from the freestone quarries ; in equal quantities.

The method of making is on a principle peculiar perhaps to these hills. Earthen barn-floors, are made, in other places, with *wet* materials ;—a kind of mortar ; which, as it dries, is liable to crack ; and requires some months, after it is made, to dry it hard enough for use. On the contrary, the materials, in the practice under notice, are worked *dry* : they of course do not crack ; and are ready for use as soon as they are finished. The materials, mixed together, are sifted twice over. The first time through a wide sieve, to catch the stones and larger gravel ; which are thrown to the bottom of the floor. The next, through a finer sieve, to separate the more earthy parts from the finer gravel, which is spread upon the stones ; and upon this the more earthy parts ; making the whole about a foot thick ; and trimming down the different layers closely and firmly upon each other. The surface be-  
ing



ing levelled, it is beaten with a flat wooden beetle, made as the gardener's turf beater ; until the surface become hard as stone, and rings at every stroke like metal. If properly made, they are said to last a length of years: being equally proof against the flail and the broom.

These materials, it is true, cannot be had in many districts ; but the principle of making barn floors with DRY MATERIALS being known, other substances than these which are here in use, may be found to answer the same purpose.

YARD FENCES: invariably of stone: some of them of due height ; but in general too low.

HOUSE WATER: *wells* being on these hills of moderate depth, *cisterns* are not necessary:

IV. DRINKING POOLS. Where *sheep* is the prevailing stock, FIELD WATER is less wanted, than it is where *cattle* abound. Nevertheless *sheep*, in a dry season, will drink freely and frequently, when they have water to go to ; and I have seen no country in which

they are so assiduously supplied with it, as they are in this district.

Where springs rise on the acivities of hills, STONE TROUGHS are placed to catch it as it rises, or as it trickles down the side of the hill. Troughs are likewise frequently set across rills. They make excellent drinking places for all kinds of stock.

In situations destitute of natural surface water, ARTIFICIAL POOLS are formed somewhat in the Yorkshire manner. \* The use of lime, however, is not known: but the nature of the subsoil of these hills being similar to that of lime, worms may be less mischievous in this than in a fat non-calcareous subsoil. The quantity of *clay* used here is much greater than in Yorkshire. Three coats; each of them nearly as thick as the single coat of Yorkshire. But they have much less labour bestowed upon them; only one beating each. The three coats are nearly a foot thick when finished. The clay is generally covered with *gravel*; on which is set a PAVEMENT! A mode of finishing of which I had conceived a high idea in theory: and which is here proved to be good in practice.

\* See YORK: ECON: vol. i. p. 146.

practice. \* The stones are set edgeway ; but in the instance, I have seen, they are too small ; especially near the brim ; and in general perhaps the *run* is not sufficiently attended to. But pools, here, are principally intended for sheep.

Artificial pools have now been made in this manner thirty years ; and few (if any) failures have yet, I understand, happened.

The form of these pools is generally square. One fourteen yards square cost in manual labour 18l. Besides the carriage of ninety loads of clay, two miles : together about 30l. But this was made by the day, and no requisite expence spared : the common price, by the gross, is 2s. 6d. a square yard ; measuring the pavement when finished.

V. FIELD FENCES. LIVE HEDGES and WALLS : the latter much the most frequent. In some few spots, where good stones are not found in plenty near the surface, whitethorn is planted, and thrives well. But live hedges are

\* It is proper to add, that, at the time I wrote the article referred to above, I was an entire stranger to the practice of forming pools on the Cotswold hills.

are expensive to raise. Ditches cannot be sunk. Two guard fences are requisite; and materials scarce. On the contrary, walls are raised at a small expence, and are fences immediately. This alone can apologize for their frequency. The country in general is still to the eye as *naked* and is almost as destitute of *shelter*, as it was before the inclosures took place. There is one instance, and I believe only one, of planting whitethorn under the walls. A practice which ought to be encouraged. The wall and the live hedge, together, will be a much better shelter than either of them, alone. The climature of the bleaker swells would by this means be rendered much more genial, than it is at present.

The dimensions of the Cotswold FENCE-WALL is 26 inches at the base; 18 inches at the coping; and  $4\frac{1}{2}$  feet high, exclusive of a coping of flat stones, where these are to be had. Sometimes a "comb" of stones set edgeways is used as a finish to the top.

The line of the intended fence being drawn, and the foundation cut out, quarries are dug by the side of it, the stones are wheeled in barrows, and the wall built by a gauge, by *masons*. If the wall be set upon the soil; the turf is liable

able to rot partially, and throw down the fence.

The cost of a wall thus made, and of these dimensions, is eight to ten pounds a furlong, or about 10d. a yard. A penny a yard is the common price for walling; the raising and wheeling, 8d. to 10d. a yard.

TEMPORARY FENCES—bar hurdles and hazle hedges.

VI. WOODLANDS. One extensive woodland near the center of these hills: chiefly in a state of *wood*: namely timber and coppice wood mixed. The timber chiefly oak: the underwood ash and hazle: the former used for hurdles;—the latter for temporary hedges and fuel.

VII. PLANTATIONS. Unfortunately for the Cotswold hills, a spirit of planting has never been generally diffused among them. Something has been done about Guiting and Dowdeswell. And an ancestor of Lord Sherborne laid out and planted a new park, near his residence at Sherborne. And Lord Bathurst's grounds near Cirencester are well known.

known. But these have all been done with a view to ornament, merely. The propagation of wood *for the use of estates* appears not to have taken place; excepting some small ASHEN COPPICES, which have been made, and still I see continue to be made, in the vallies, for hurdle stuff. Farms, in general, may be said to be totally destitute of wood. Coals are fetcht 20 to 30 miles by land carriage; and faggot wood perhaps 8 or 10 miles. Not a pole upon the farm to assist in making a temporary fence, nor perhaps even a handful of brushwood to kindle the fire. Straw, I am afraid, is here considered as an article of fuel: a circumstance which reflects no credit on the owners of landed estates.

It strikes me forcibly that the corners and asperities of every estate ought to be cut off, and the angles filled up with COPPICE WOOD: and that the more central farms ought each of them to have its SKREEN COPPICES; sufficiently extensive to admit of a plot being filled every year, for the use of the farm, and the cottagers of the township it lies in.

In winter, the poor, on these shelterless hills, must be in a wretched state as to FUEL.

There

There are few hill countries which do not afford either wood, coals, peat, or at least turf; but here straw may be said to be the only fuel the country at present produces. Fortunately for the farmers stone walls will not readily burn.

Few countries are so well adapted to the propagation of woodland as this. Wall is of all other the best plantation fence; and here it is raised at an easy expence. Mark out the intended site: cleanse it by a turnep or a whole summer fallow: wall is round: dibble in acorns, beech masts, ash keys, hazle nuts, or other seeds of wood best adapted to the purpose intended: cleanse during the first three or four years: and fell at the age best suited to the ware required.

For the minutiae of the propagation of woodland from seeds, see PLANTING and ORNAMENTAL GARDENING, a practical treatise, page 506.

VIII. FARMS. It is needless to say that the Cotswold farms are strictly ARABLE: though most of them, especially on the eastern margin, have more or less grassland belonging to

to them; but, in almost any instance, it is inconsiderable, comparatively with the arable land.

the size of farms, mostly large: from 200 to 1000 acres each. There is one instance of a tenant occupying near 2000 acres. Five hundred acres may be considered as a middle-sized farm.

With respect to PLAN, the Cotswold farms are in general without regularity. The houses stand mostly in villages. Even in the inclosed townships there are few central farmeries. One exception, however, on Lord Sherborne's estate, requires to be noticed. In this instance, five hundred acres are laid out *at present* in nine inclosures; with a commodious drift way across the middle; and with a farmery, and a large artificial drinking pool near its center. Altogether perhaps as well laid out as the nature of it would admit. But no wonder:—it was planned by its intended occupier;—a *professional* man; and one who in truth stands among the first of the profession.

## IX. FARMERS.



IX. FARMERS, The Cotswolds, like other large-farm districts, abound with intelligent, respectable farmers.

X. WORKMEN. LABOURERS are remarkably numerous for the nature of the country; and their wages as remarkably low. A shilling a day, no beer, in autumn, winter, and spring. Fourteen pence in hay time; except for mowing 18d.; and 2s. a day, for five weeks certain, in harvest. Women in autumn and spring 6d. in hay time 7 d. in harvest 1s. No beer; except what is given voluntarily.

SERVANTS' wages are likewise low: ten pounds the highest. Second men so low as five or six pounds. The standing food of farmers' servants, here, is bacon: with which they are allowed vegetables: a salutary accompaniment, which these most useful members of society are, perhaps through a mistaken policy, debarred from, in some districts.

XI. BEASTS OF LABOUR. *Horses* and *oxen*. The proportion, I fear, more than two to one.

OXEN,

OXEN, however, are in good estimation; and, what is still more pleasing, they are growing in the esteem of most farmers; and their number, in consequence, annually encreasing. They are all worked in harness, at length, alone. The collar and hames being used as for horses; not reversed, as in most cases they are for oxen. They appear to be perfectly handy, and work, either at plow or cart, in a manner which shews that, although horses may in some cases be *convenient*, and in most cases *pleasurable to the driver*, they are by no means *necessary* to husbandry.

THE BREEDS of WORKING OXEN, on these hills, are those of Gloucestershire, Herefordshire, and South Wales (a variety of the middlehorned breed). They are usually bought in at four years old, and worked till six; when they are either sold to graziers, or fatted on the premises. There are instances of their being worked to twelve or fourteen years old. But few work well to that age. They are found to grow heavy and inactive. Every thing, however, depends on breed: and, by due attention, a breed of oxen might, without doubt, be obtained, which would work well

well, and fat kindly, at twelve or fourteen years old.

THE FOOD OF WORKING OXEN is straw in winter; hay in spring; and raygrafs, with other cultivated grasses, in summer. They are seldom worked in winter, while at straw; except to keep them in a degree of exercise, and enure the young ones to harness. In early spring, when they are first put to the plow; they have ordinary hay or "saintfoin or raygrafs straw:" which, after *corn straw*, and before the dry winds of March have rendered them dry and harsh, are eaten with sufficient appetite. As spring advances, better hay is afforded them.

From the time they are put to hay in the spring, until they are thrown up to straw in autumn, oxen which are kept solely for work, are generally in harness six days in the week. They are mostly used in plowing.

A MOVEABLE HARNESS-HOUSE—a wooden cabin with a sledge bottom—is drawn from pasture to pasture, or from place to place, as circumstances may require; by which means no time or labour is lost, either by the oxen, or their drivers. Five oxen are a team.

The

The HORSES worked on these hills are of the heavy-heeled kind; but, in general, lighter than they are in many other districts. Men of penetration, here, begin to see the folly of sending elephants to plow: it would, indeed, be equally wise to send horses to battle with castles on their backs. The horse, which seems to be growing into estimation as a plow horse, at least, is a kind of strong coach horse; the best breed for the purpose this kingdom is possessed of.

Five horses are considered as a team; and are the prevailing plow team of the country; except for stirring turnep fallows;—during which operation some few plow teams of four horses each are seen.

A particularity in the manner of FEEDING CART HORSES with corn, here, is noticeable. In the ordinary practice of other districts, it is the custom for each carter to feed his own team. But here, one man, the “head carter,” corns the whole stable. This may be a means of preventing pilfering. Indeed, the feeder being considered as a confidential man, is seldom allowanced. Another advantage in this case is, that only one confidential servant  
is

is requisite; whereas, when every man has the sole care of his own horses, more or less confidence is obliged to be placed in each.

A circumstance, occurring in this district, relative to the TREATMENT OF FARM HORSES, is entitled to notice. The idea is not new to me; but I have not met with an incident, before, sufficiently authentic to warrant its being mentioned.

In the livery stables in London, HE-GOATS are kept, for the purpose of preserving the health of the horses, which stand in them.—Many carriers keep them in their stables for the same purpose; and I have somewhere met with an instance of farmers doing the same; particularly as a prevention of the *staggers*: but I have always considered it as one of those popular *charms*, of which *wonderful* effects are related in every country. Nor have I yet any *proof* to the contrary: all I have at present to produce is *strong evidence*: I give it, however, on such authority as no one, who knows the author, will dispute.

About sixteen years ago, Mr. William Peacey, of Northleach, lost several horses in the staggers. He was advised by a friend,  
VOL. II. D whose

whose experience had led him to believe, that he had benefited much by what he recommended,—to keep a he-goat in his stables.—He got one, and had not for many years another instance of the disorder. While the goat lived, his horses were free from the staggers; but the goat dying, his horses again became afflicted with this alarming disorder. He procured another goat (which is still living) and has not since had an instance of the staggers. He has seldom less than twenty horses in his stables.

I do not mean to *recommend*, in general terms, the keeping of goats in farm stables. But if this terrible disease can be prevented at so trifling an expence, what farmer in his senses would be in want of a goat? In the midland counties, three years ago, many farmers lost all their best horses in the staggers. Loss, to the amount of several thousand pounds was sustained in Staffordshire alone.

I dwell the longer on this incident, as it appears to me probable, that the influence of the goat is not merely that of a charm. The staggers appears evidently to be a *ner-*

*vous*

*vous* disorder. Odours are found in many cases, I believe, to act beneficially on the human nerves; and, possibly, the strong scent of the goat may have a similar effect on those of the horse. The subject is certainly entitled to enquiry.

XII. IMPLEMENTS. The Cotswold WAGGON has been mentioned. The vale waggons are said to be copied from it; and every country might profit by its introduction.

The Cotswold PLOW is of the old long heavy construction; with a single wheel. It is steady, and makes good work, if properly used; but requires great draught.—Five horses or five oxen; never, I believe, less than four. Soil, which is at once tenacious and stoney, requires, no doubt, a steady plow, and a strong team: nevertheless, I am of opinion, that there is at present a waste of team labour upon these hills. The double plow of Warwickshire is, perhaps, the most likely to effect an improvement. The Norfolk plow has been introduced; I saw two or three of them at work in one piece of turnep ground; where they made good work; but

they are unfit for the Cotswold soil; except in the fallowing season. The Yorkshire plow would work much better in it. The Turnwrest plow is certainly wanted on the "sideland" farms.

But a multiplicity of implements incurs an expence, which few farmers are willing to pay. Yet if any department of husbandry requires the especial attention of the *arable* farmer, it is that of working his land at as easy an expence as possible. If the Cotswold farmers object to two sets of plows, let them endeavour to improve their own.

### XIII. MANAGEMENT OF FARMS.

The primary OBJECT of the Cotswold husbandry is SHEEP. *Cattle* are secondary, and comparatively few in number. *Horses* and *swine* are subordinate; being kept merely for the use of the farm.

The *marketable crops* are BARLEY and WHEAT. The *subordinate crops*, raised for the support of the live stock, are *turneps*, *oats*, *peas*, *vetches* (*vicia sativa*) *tares* (*ervum hirsutum*!) *saintfoin*, other *cultivated grasses*, *natural grassland*.

The



The great art of farming in a hill country lies in guarding against dry seasons; and, of course, in proportioning the stock and the subordinate crops, in such a manner, as always to have a sufficient store of dry food before hand; and *room* enough, at least, in the pasture grounds. To overstock any farm is bad management: to overstock a hill farm is unpardonable,

#### XIV. COURSE OF HUSBANDRY.

The Cotswold farmers have either fallen into the Norfolk system of aration, or have struck one out similar to it. The prevailing practice, in the inclosed townships, is to divide the arable land into seven parts. One for saintfoin; the other six for the following crops.

|          |                 |
|----------|-----------------|
| Turneps, | Grasses,        |
| Barley,  | Wheat,          |
| Grasses, | Oats, peas, &c. |

Considering the profitableness of saintfoin, in any season, and its being in a manner proof against a dry one; and considering at the same time the disposition of the soil of these hills to produce it,—a seventh of the arable land may seem too small a proportion for this almost

ineffimable crop. But a fourth would, perhaps, be too great a share. It, therefore, seems necessary, that the round of annual crops should be altered, or that the whole should remain under the present regulation\*.

## XV. SOIL AND MANAGEMENT.

The SOIL has been sufficiently described.—We, therefore, proceed to its MANAGEMENT.

I. BREAKING-UP. During the inclosure, a greater or less quantity of old turf was, probably, broken up, in most townships. But, at present, the only subject of this operation is faintoin ley.

The invariable method of breaking up old turf, on these hills, is, by SODBURNING FOR TURNEPS. Except in some few cases, in which landlords, for want of due information  
on

\* The ANCIENT COURSE of the common fields of these hills was singular. Each township was divided into two fields; for "crop and fallow,"—alternately: one year wheat and barley, the next a whole year's fallow: except a small part of each township, which was used as a kind of every year's land; for growing a few peas, oats, or other subordinate crop.

on the subject, debar their tenants from benefiting by this excellent practice\*. In these cases, the turf is broken up with the plow, for oats, peas, &c. and got into tilth, next year, for turneps.

The art of sodburning—provincially “paring and burning”—or “breast-plowing”—is well conducted; and the benefits arising from it seem to be, in general, well understood. The great difficulty, here, is in getting turf tough enough to handle, and rough enough to burn. Temporary leys, and even stubble, are not unfrequently pared; and, if unfit for burning, the parings, when duly digested, plowed under with the seed plowing of the succeeding crop. This is found to be nearly as cheap as two plowings; and, in many respects, preferable.

This practice is new to me. It seems admirably adapted as a preparation for sowing on one plowing. The surface weeds are effectually cut off; and, by lying some time on the surface, become a fit nutriment to the infant crop. In plowing, the sod naturally falls to the

\* See YORK: ECON: i, 304.

the bottom of the furrow ; and not only prevents the seed from running down too low, and thereby being buried too deep, but forms a proper nidus for it to fall in. The infant plants, instead of having the living weeds to struggle with (which is the case when the whole furrow is sown, as in most cases it ought to be, while fresh) find in them, when digested, a friendly assistance: while the toughness of the furrows being done away, by the operation, they become obedient to the harrow: the surface is, of course, rendered fine, and the seed duly covered.

The Cotswold labourers are expert and indefatigable in the work of " breast plowing" —the most slavish work of husbandry. The paring, burning and spreading has been done for 15s. an acre! from 15 to 20s. the common price; *notwithstanding the stoniness of the soil.* In some districts the paring, alone, would cost as much. Paring for plowing under is sometimes got done in winter, a leisure season, so low as 5 to 7s. an acre. When fods intended to be burnt have been caught in a rainy season, as they are liable to be in every country, and have grown to the ground by lying

ing a length of time upon it, they have been turned back again, for half a crown an acre. An admirable operation, this, when it can be done at so low an expence.

Sods are all burnt in small heaps, about a rod apart; the unburnt pieces are collected and burnt together in fresh heaps. Not a piece of raw sod the size of the hand to be seen. Sometimes the ashes are spread presently after burning; but more generally, I apprehend, they are suffered to stand in heaps, until barley seed time be done; when they are spread among the grafs and weeds which have risen, and the land plowed the first time for turneps.

2. TILLAGE. The Cotswold farmers are sparing of tillage: in the ordinary course of husbandry, they never plow more than once for any crop; except turneps; and for this, in the common practice of the country, seldom more than three times. So that in the established round they have six crops for six plowings.

There are men, however, who do not limit the number of their turnep-fallow plowings; but continue stirring until the weeds be overcome, and the soil be brought into a proper state

state of tilth ; and they find their account in it, I saw a piece of clover, succeeding, in course, a turnep fallow of seven plowings ; and it was worth any other two pieces of equal size I saw in the country. This, and the other crops of the course, will, in all probability, pay ten fold for the extra plowings.

It would certainly be eligible in any large occupier to have a set of light two-horse plows, for the purpose of stirring his fallows. He would with them give his fallows five plowings, with the same expence he now gives them three. The price of the Yorkskire plow complete is not thirty shillings \* : if men could be got to hold them properly, a set of these plows would earn their cost doubly the first season.

With the present extravagant plow team, farmers, in general, cannot *afford* to keep their lands in sufficient tilth. The ordinary price of plowing is 8s. an acre. Each plowing now costs them, perhaps, as much as the rent of their land.

The Cotswold farmers are singular in their ideas respecting a leading principle of tillage.

They

\* See YORK: ECON: vol. i. p. 277.

They endeavour to plow, for a crop, when the soil is *wet* ; and to work even their *fallows*, when they are *moist*. They argue that if they plow their fallows dry, they lose their soil, which gets shallower every stirring. This is, probably, owing to the nature of the soil, and the nature of their team. The soil is mostly of a blinding quality. Five horses following each other, in the same track, render it, in dry weather, as firm, and almost as hard, as a pavement. In the next stirring, the share refuses to lay hold of it ; and, in this operation, another layer of soil is trodden down. Two horses drawing abreast would not produce this effect.

It may be said to be the universal opinion of farmers throughout the kingdom, that fallows most especially ought to be plowed when they are *dry*. I never met with the most distant intimation, before, that plowing them when *wet*, or even *moist*, was anyway eligible ; excepting two incidents which occurred in my own practice ; in which plowing fallows *very wet*, was apparently destructive of couchgrasses. \*

The

\* See MIN: OF AGRICULTURE. Date, 20, May, 1775.

The intention, however, of the practice under notice, is not that of destroying weeds, but of assisting the crop: nevertheless, it is observable, that, notwithstanding the small quantity of tillage which the lands of these hills receive, they are far from being remarkably foul;—nor do they appear to the eye strikingly deficient in tilth. Their productiveness, however, is not equal to their general appearance: and, *perhaps*, working the land while wet is at once injurious to the weeds and the crops which follow.

One objection will probably be made to this general position. It is observed, in many countries, that wheat never succeeds better than when the seed plowing is given while the soil is wet. But may not the advantage, in this case, arise from the prevention of weeds, rather than from any immediate benefit to the crop?

These reflections, however, are offered with the greatest diffidence. The PRINCIPLES OF TILLAGE may be said to be as little known, now, as they appear to have been in the day of Hesiod. Much, no doubt, depends on situation and specific quality of soil: nevertheless,



less, it is not probable, that a practice so closely connected with an important process of nature, as is that of adapting the soil to the purposes of vegetation, should be entirely destitute of GENERAL PRINCIPLES. Every glimmering of light, tho' faint, ought, therefore, to be collected, in order to endeavour to elucidate this important subject, and raise it from its present obscurity.

Another instance of practice respecting fallows is entitled to particular attention. It requires no comment: its eligibility is evident at sight; and its establishment as a practice is likely to reflect much credit on the spirited management of these hills. For although it may be said to be, as yet, the practice of one individual only,—this individual is at the head of his profession; in a country which abounds with intelligent husbandmen; and there can be no doubt of a practice so obviously eligible being extended.

I have myself WEDED a fallow, to prevent the weeds from seeding before the plows could be at leisure to turn them under; but never had an idea of the HOING OF FALLOWS, until

til I saw the operation in practice, upon the Cotswold hills.

It has hitherto been chiefly applied to beds of the *common corn thistle*; and with striking success. I walked over a piece of wheat after a thistley fallow; without perceiving a thistle in it. Though it had neither been hoed nor weeded. It was in effect *weeded in the fallow*.

The operation is performed some days, or perhaps a few weeks, before plowing.—the hoe taking off the top, somewhat beneath the crown, the root has fresh shoots to make: while these shoots are yet in a tender state, the plow severs the root below. By these means the plants, if not destroyed, receive a check which they do not readily recover.

The work is done by women, boys and girls, with full-sized turnep hoes. The operation requires no dexterity, nor is it by any means tedious. There are no plants to set out; nor any crop to hinder. When the ground is gone over, the hoers return to the side they began upon, and go over it a second time, to cut up such as have been missed, in the first time going over.

The

The same excellent manager spuds up thistles, and other perennial weeds, in his raygrafs leys, previous to their being plowed for wheat ; and with a similar effect. His wheats seldom or ever want weeding. It is always better management to PREVENT WEEDS, than to DESTROY THEM IN THE CROP.

XVI. MANURES and MANAGE-  
MENT. The MANURES principally in use are *dung*, *sheepfold*, and *ashes* procured by sod-burning. A bed of a species of blue *marl* has lately been discovered, and its effect proved on grafsland.

The effect of *dung* on the Cotswold soil is extraordinary. There is an instance produced of its lasting near fifty years ! Its effect is evident in a piece of wheat now growing (May 1788) on a patch, lately common field land, which now makes part of an inclosure.

But this extraordinary effect is on land which lies at a great distance from the dung yard ; and is perhaps no more than an incident, (striking in those days) of the efficacy of a *new* manure,—even of dung,—on land which has not been accustomed to it. It is well known  
that

that the dung of *sheep* (the sheepfold) is singularly beneficial to land which has not been folded upon; and there seems to be no reason why the dung of *horses* and *cattle* should not be similar in their effects. The duration is the only thing extraordinary. The retentive nature of the soil is the only probable cause of it. Had not the fact been well authenticated by a most intelligent husbandman\*, who has personal knowledge of the circumstance, and has probably seen every crop which has grown upon the land since the circumstance took place, I should not have thought it an object of notice.

MANURING. In the established course of husbandry, the manure is wholly applied to the turnep crop. And for this seldom more is set on than ten loads of dung an acre.

XVII. HARVESTING. The harvest is got in chiefly without foreign assistance: (except some few reapers from the forest of Wichwood): a remarkable circumstance in a wold country. Wheat is invariably reaped and set up in "shucks" *uncovered*. Barley and

\* Mr. John Craddock of Northleach.

and oats are mown outward, and harvested in swath. The work is principally done by harvestmen, hired for five weeks certain, at two shillings a day, no board nor beer; except what is voluntarily given.

**XVIII. FARMYARD MANAGEMENT. I. BARN MANAGEMENT.** Thrash in the south-country manner. Winnow, in the common practice of the country, with the sail fan. Some few machine fans in the district.

**2. STRAWYARD MANAGEMENT.** Store cattle go loose in yards. The straw being given in moveable cribs: or in mangers formed against the fences.

I met with an idea, here, that cattle may be satiated with straw; or, in other words, may be served with it in too great plenty. It has been observed, that after a dry summer, when straw is scarce and the cattle have it dealt out to them regularly, they do better, than when, after a plentiful year, it is thrown before them in profusion from the thrashing floor. Not through the superior quality of the straw in a

VOL. II. E scarce

scarce year; as these effects have been observed to be produced from the same straw.

This subject is by no means uninteresting to those who winter large quantities of cattle. I have observed in Yorkshire, where cattle are kept tied up, and of course are regularly fed, that they in general do better at straw, than cattle in the south of England where they go loose among a much greater plenty; but whether it proceed from the warmth, from their resting better, from the breed of cattle, or from their being regularly fed and *eating with an appetite*, I will not pretend to decide.

XIX. MARKETS. Smithfield, principally, for sheep and cattle. Gloucester for barley. The country millers for wheat. It is observable that in this district; more particularly, I believe, in the manufacturing country, about Stroud;—the miller and the baker center in the same man. The mill and the bakehouse being covered by the same roof.

XX. WHEAT. 1. The SPECIES principally “red lammas”—some “cone” is grown; but it is not so prevalent here as in the vale.

A NEW

A NEW VARIETY of cone wheat has lately been raised, from the mere circumstance of finding one grain in a parcel of seed. The body is remarkably long and large; but the quality, (as yet) is not good, or at least not highly. I mention it merely to shew that, by a little attention, new sorts of corn may be readily raised; even from a single grain.

2. SUCCESSION. Wheat generally succeeds the second year's ley, once plowed. When land is very foul, it is sometimes summer-fallowed for wheat.

3. TILLAGE. Endeavour to begin plowing early in July; and let the land lie in rough furrow until sown.

4. SOWING. 1. *Time of sowing.* The Cotswold hills are in a manner proverbial for the early sowing of wheat. August and September are the principal months. The general rule is to begin plowing in July, and begin sowing the first *wet weather* in August. Wheat seed time therefore generally commences in wheat harvest. Scarcely a handful of new wheat is sown in the district.

It is, however, seldom sown when more than one year old. There is, indeed a popular

lar idea (not altogether well founded however) that wheat will not grow if more than that age.

The Cotswold farmers wish to see the ground covered before Michaelmas. The motives held out for this very early sowing are, that less seed is by this means requisite ; and that it is known from experience that early sown wheats do the best on the Cotswold land.

This is another striking evidence of the wide difference in the customs of countries, with respect to the time of sowing wheat ; and corroborates, strongly, the idea of these customs being founded on EXPERIENCE ; not on *habit* or *caprice*. The districts which form the two extremes are included within the same county : lie contiguous to each other ! A stone might be slung from the country which sows its wheat in August, into that which sows its wheat in December !

2. *Quantity of seed.* In August, the ordinary quantity is *six pecks* ; about fourteen gallons ;—in September *two bushels* ( $9\frac{1}{2}$  gallons each). But it has been found that *one bushel* sown in August, provided the land be clean and in heart, is abundantly sufficient !

We



We may venture to say that one third of the seed wheat sown in most other districts is saved in this. A saving of some importance when wheat is dear.

3. *Covering*. "Dragged" and "harrowed": that is harrowed with rough and fine harrows: and what is peculiar, I believe, to the west of England, SHEEP are generally PENNED upon the land, or at least DRIVEN repeatedly over it, between the sowing and the coming up. A practice which might perhaps be found beneficial in other upland districts.

5. VEGETATING PROCESS. If wheat get rank in autumn, it is esteemed good management to eat it down with sheep: not, however, by a few kept long upon it; but by a large flock, at once.

This is a new idea. The practice may be good. The great complaint against the early sowing of wheat is that of its being liable to get winter-proud. EATING it off, in AUTUMN, may give it a check, and prevent that evil consequence. Eating it *in Spring* is here considered as pernicious.

Wheat is usually *weeded* with spud-hooks; not hoed, as in the vale. One instance, how-

ever, in which a thin crop, full of seed weeds, was HOED IN AUTUMN with uncommon success, occurred in the practice of a superior manager, in this district: and others in which wheat have been WEEDED IN AUTUMN, with great advantage. Where wheat is sown very early, as in this district, and the land at the same time full of seed weeds, one or other of these operations seems to be in a degree requisite.

6. HARVESTING. The method of harvesting has been mentioned.

I met with a well authenticated instance, here, of the good effect of *cutting MILDEWED WHEAT while very green*. A fine piece of wheat being lodged by heavy rains, and being soon after perceived to be infected with the mildew, was cut, though still in a perfectly green state: namely about three weeks before the usual time of cutting. It lay spread abroad upon the stubble until it became dry enough to prevent its caking in the sheaf; when it was bound and set up in shucks. The result of this treatment was, the grain, though small, was of a fine colour, and the heaviest wheat which grew upon the same farm that season:

season ; owing no doubt to the thinness of its skin. What appears much more remarkable the straw was perfectly bright ; not a speck upon it.

The idea of the judicious manager, in whose practice this expedient took place, is, that cutting the crop, “ as soon as it is struck, *kills* the mildew.” And on this principle he practises himself, and recommends in general terms, the cutting of mildewed wheat “ as soon as it is struck.” It is well understood that the sap or nutriment, which is in the stems of corn that is cut under-ripe, circulates to the ear, and fills the grain, in the same, or in a similar manner, as it would have done, had the stems remained upon their roots. Hence, the advantage of cutting mildewed wheat as soon as it is infected with the disease seems to be, that, by thus stopping the disease, the nourishment in the straw, passes to the ear in a pure untainted state.

7. BARN MANAGEMENT. Wheat is most of it kept in the rick over the winter ; and, when the markets are flat, frequently over the year. There is at this time (May 1788) more unthrashed wheat on the wolds of Glo-

E 4                      cesterhire,

cestershire, than perhaps any other entire country is possessed of. The *strength* of the farmers, and the practice of sowing old wheat, account for it. In countries where new wheat is sown, it is in some degree necessary to begin thrashing immediately after harvest. In this country, there is a similar necessity for keeping wheat in the straw over the winter. Wheat generally bears the best price in summer. The Cotswold farmers experiencing annually, through the nature of their practice, the advantage of having wheat to dispose of in summer, endeavour to keep all they can until that season: and, no doubt, find their interest in the practice.

8. MARKET FOR WHEAT. The millers of the neighbourhood. The measure nine gallons and a half, bare. The medium weight of clean wheat, in a good season, 70lb.

9. THE PRODUCE OF WHEAT. Twelve to twenty bushels an acre. Two quarters of wheat an acre may, perhaps, be taken, on a par of years, as the medium produce of these hills.

GENERAL OBSERVATION. The produce, and the weight (considering the measure) are both of them strong evidences against the Cotswold

Cotswold soil, as a matrice for wheat. It strikes me forcibly, that too large a proportion of it is, at present, appropriated to this crop. It is an error in the practice of most upland districts to grasp at too much wheat. I know not a more common, nor a more *fatal* error in husbandry. The Cotswold soil is evidently adapted to *barley*; but very little of it to *wheat*. Yet, in the ordinary course of husbandry, the number of acres respectively occupied by each of these crops is equal.

I do not mean to cavil at the Cotswold practice, which is, in many respects, very judicious; nor to dictate in positive terms to the Cotswold farmers: but I flatter myself they will excuse my offering my sentiments on this interesting subject. I am clearly of opinion, that, instead of the whole of the second year's leys being indiscriminately plowed up in July or August for wheat,—such part of them only as can, with an ordinary season, be *depended* upon for a middling crop; say twenty bushels an acre; should be sown with wheat. The rest to be reserved for barley: either to be broken up after harvest, winter plowed,  
and

and sown in early spring; or, if this should interfere too much with the present spring crops, attempt to sow barley in autumn; (I have reason to believe, from my own experience, that it will stand the winter perfectly well\*) or, if this cannot be done with certainty, leave out the oat crop, or otherwise alter the present system of management, in such manner, as to render it convenient to sow a greater proportion of barley, and a smaller share of wheat.

**XXI. BARLEY. 1. SPECIES.** The common long-eared barley.

2. **TIME OF SOWING.** The latter end of March, and the beginning of April: a fortnight before, and a fortnight after, Lady day.

3. **QUANTITY OF SEED.** Three bushels an acre. This, the measure and the time of sowing being considered, is an extraordinary quantity of seed. But land which is naturally inclined to tenacity, is out of tilth, and sown with barley on one plowing, may, unless the season prove uncommonly kind, require it.

4. **HARVESTING**

\* See MIN : OF AGRI: date, 2 Feb: 1776

4. HARVESTING. Cocked with corn forks and at present raked with drag-rakes ; an implement but lately introduced, here.

5. BARN MANAGEMENT. Mostly thrashed in winter. Sometimes kept over the year, on account of price ; or as a source of fodder, in case of a dry season.

6. MARKET. Gloucester: where it is bought chiefly by the Bristol factors. *Measure* the same as wheat. Weight 60lb.

7. PRODUCE. Twenty bushels to four quarters an acre. Three quarters are deemed a fair crop.

GENERAL OBSERVATION. This is a low produce ; and may seem to militate against the practice I have just recommended. It must be observed, however, that this produce is from land deficient in tillage ; and that barley delights in a fine pulverous tilth. It must also be considered that wheat in this country occupies the soil perhaps upwards of twelve months ; barley not more than six ; and that the feed-age of the leys in the wane of summer are lost by the wheat crop. Other arguments offer themselves in favor of the proposed alteration ; but it was, perhaps, enough in me to intimate,

mate, what appears to be an improvement ; and I may, perhaps, already have said too much.

**XXII. TURNEPS.** 1. SPECIES. Various—white—red—green—round and long-rooted. The Norfolk white-loaf seems to be in the best esteem.

2. SUCCESSION. In the established course, turneps succeed oats, &c. ; or faintfoin ley, when this is broken up by fodburning

3. TILLAGE. The *stubbles* are broken up in winter ; and have, after barley seed time, two, or perhaps three more plowings. Some collect the root weeds into heaps and burn them ; others leave them on the surface to wither. The *fodburnt ground* is, in the common practice of the district, rice-balked, or half-plowed, as soon as barley-sowing is done ; and the balks crossed by the seed-plowing. But some good farmers object to this management ; rather choosing to give it two clean plowings, fleet, and across each other. While others judge one plowing to be best. Considering the price of plowing and the sparing hand with which it is applied in this district, it  
is



is to me a matter of surprize how two plowings should, in this case, become customary.

4. MANURE. Upon the *stubble ground*, about ten loads of dung is considered as a tolerable dressing. The *sodburnt land* has nothing but the ashes.

5. SOWING. *Time of sowing.* Begin the latter end of May, and continue sowing until August.

*The quantity of seed*; one to two pounds.

6. HOING. Good farmers, and farmers in general, I believe, hoe twice. There are, nevertheless, some few men, still left, who do not think that even one hoing is necessary.— The price of the two hoings 6s. an acre: four for the first, two for the second: the land all stirred the first time over. This, considering the stoney quality of the soil, is extraordinarily cheap.

7. EXPENDITURE OF TURNEPS. They are all fed off with sheep, as they stand upon the ground: beginning upon them about Michaelmas: mostly fattening sheep without followers. Give them a fresh “hitch” every day: and if hurdles can be had in sufficient plenty, leave three or four shifts of the eaten ground

ground open, for the sheep to fall back upon ; for it is found that, in three or four days, they will return to the scraps and pick them up in preference to those, which have been recently made. This is a minutia of practice, which is not universally attended to ; but if it be right, in any country, to eat off turneps upon the ground, with *one* flock of sheep, this circumstance is certainly worthy of attention.

Another minutia of practice, which does the attention of the Cotswold farmers (those, at least, who observe it) very great credit is, that of "FOLDING UP-HILL :—" beginning upon the lower parts of the field or piece to be fed off, and proceeding upward ; not upon the higher parts and proceeding downward.—Sheep have a natural propensity to lodge upon high ground : if this be fed off first, and left open as in the above practice, no sooner have they satisfied themselves, on the lower grounds, than they return to the hill to lodge : on the contrary, if the lower parts be eaten off first, and the fold carried still higher every move, they follow the hurdles : consequently, every part becomes evenly trodden and equally manured.

### XIII. CUL-

## XIII. CULTIVATED HERBAGE.

In districts, in which natural grassland is scarce, the CULTIVATION of HERBAGE becomes a primary object of attention; and nowhere do we see it so assiduously attended to as on these hills. The two principal species——SAINTFOIN and RAYGRASS—are here cultivated with superior skill.

1. SAINTFOIN. The entire wolds are productive of this princely herb. The calcarious rubble, which has been mentioned as forming the subsoil, is in some places two or three feet deep; and the rock, below, mostly open. The roots have been traced, in stone quarries, to ten, some will say twenty feet deep. Here the saintfoin flourishes luxuriantly. But in other places the rock rises, in flat horizontal seams, to near the surface: there the saintfoin is weaker, and goes off sooner. It is said to have been cultivated upon these hills upwards of one hundred and fifty years.

The

The culture of faintfoin requires, in this place, to be registered in detail, under the following heads :

1. Succession
2. Sowing
3. Management while young
4. After management
5. Expenditure of hay
6. Expenditure of aftergrafs
7. Its duration on these hills
8. Recroping the Cotswold lands with faintfoin

1. *Succession.* In the established practice, faintfoin is generally sown with barley after turneps.

But it has lately been discovered, in one of those INCIDENTS of practice, to which every farmer ought to be attentive \*, that it is more eligible to sow it with oats after wheat : that is, when the soil is foul !—even with couchgrafs !

Saintfoin, sown on a soil which is clean and in tilth, is liable, on the Cotswold hills, to be choaked with “ bents” (*bromus mollis*) which, feeding

\* See EXPERIMENTS AND OBSERVATIONS. &c. p. 1.

feeding before faintfoin is cut, annually encreases. The weaker plants of faintfoin are, by this means, smothered or kept under, and the quality of the hay proportionally injured.

In laying down land, which had been inclosed from intermixed common field, and which was, of course, in various states as to tilth and foulness, it was observed, in more instances than one, that where the land happened to be foul, the bents were few, while that which was clean and fine, at the time of sowing, was, in a few years, overrun with them.

This incident was caught at; not, however, by slovens, for the purpose of saving trouble or expence; but by men, whose activity and spirit, in matters of husbandry, are indisputable. Saintfoin has now been repeatedly sown, on a large scale, on soil worn out and fouled by a succession of corn crops: and the event has been invariably what the incidents pointed out. The couch occupying the surface prevents the bents from gaining a footing; while the faintfoin, feeding in the subsoil, has little occasion for the surface.

It has ever struck me, that saintfoin ought to be sown when the soil is *poor*; that is, out of heart as to manure; in order that it may be induced to strike downward, and feed below; as well as to prevent the grasses and weeds from luxuriating above, to its annoyance: but I had no conception of its being able to work its way in a bed of couch. The plants are, it seems, checked during the first two or three years; but, at length, the couch dwindling, or in its nature growing weak for want of the ground being stirred, the saintfoin gains full possession: and although it may be then *thinner* than saintfoin sown on a clean surface, *this* is thought to be no disadvantage to its productiveness. It is allowed, however, that the land, on breaking up saintfoin cultivated in this manner, is still foul. But even this circumstance has its attendant advantage, in this country; it affords an eligible turf for fodburning; and although this operation may not clean it thoroughly, it is to be remembered, that its foulness was caused by a succession of corn crops, previous to the sowing of the saintfoin; and that had it not been sown, the  
the

the soil would have required a fallow to cleanse it.

Nevertheless, upon the whole, it does not strike me as a practice to be universally recommended to the cultivators of saintfoin:—circumstances vary in different districts; and the same judicious cultivator, who has struck out, and indeed may be said to have established, this novel practice, has found, that the bents may, in a clean soil, be overcome by handweeding, the first and second years; for although every bent may not be extirpated, the surface afterward becomes too stale for the seeds to strike in; and it appears to me more than probable, that the expence of handweeding is not equivalent to the loss of produce, by the new practice, in the crops of the three first years.

My observations are the fuller on this subject, as it appears to me interesting; and, notwithstanding the practice, which has been struck out, may be in some respects objectionable, it has already been adopted, by some principal farmers; and will, probably, in a short time, become the prevailing practice of the Cotswold hills.

2. *Sowing saintfoin.* *The time of sowing saintfoin*, here, is the middle of March; or from that time to the latter end of the month.

*The quantity of seed* is proportioned to the state of the soil. A foul soil requires more seed than one which is clean: from one bushel to three bushels an acre. The advocates for thin saintfoin think a bushel of seed sufficient; provided the soil be clean.

This is another interesting particular, in the cultivation of saintfoin. It is remarked by men of observation, that where the plants of saintfoin stand at some distance from each other, they grow taller, stronger, and afford more herbage, than where they stand thick upon the ground; in which case, the plants are not only weaker; but the crop is shorter and less productive. The *strength* of the plants may, perhaps, be the only cause of difference: a strong plant, in all probability, strikes deeper than a weak one; by which means its pasture is proportionally enlarged\*.

3. *The*

\* PRICE OF SAINTFOIN SEED,—three to six shillings a bushel,—four shillings and sixpence a medium price. Chiefly raised in the neighbourhood.



3. *The management of the saintfoin crop while young.* But if thin saintfoin be advantageous, why not set out the plants, and keep them clean the second year, with the hoe? With this, and a small addition of handweeding, when the bents run up to head, these troublesome weeds might, perhaps, be wholly overcome.

4. *The after management of saintfoin.* It is invariably mown every year. If it be once suffered to be eaten with stock during the summer season, its productiveness is in a manner destroyed; it is said that it will not, in this country, ever afterward rise to the fithe.

It is a principle here laid down, by men, who seem to have paid singular attention to the culture of this plant, *that it ought never to be eaten upon the ground when in a growing state.* They have reduced their ideas to still greater accuracy; they are clearly of opinion, that saintfoin cannot, on a par of seasons, be fed with *safety* in more than two months of the year: namely the months of October and November: in a mild December, it will frequently make a shoot; which being crot is said to be nearly fatal to the plant. Pasturing

in spring is observed to have a similar effect. Even mowing too early is considered as very prejudicial: and what appears extraordinary, (being contrary to the general nature of plants) suffering the plants of *saintfoin* to mature their seed is believed to prolong their duration!

It is well known, that cutting *trees* while in a state of growth, is injurious to their future progress; being, it is understood, prejudicial to their roots: and cutting this strong, deep-rooting plant, in a similar state, may have a similar effect. If the injury be done to the root, and take place in the lower extremities of it, the damage, which follows, is easily conceived; for whatever portion of the length of the root is destroyed, in such proportion will the pasturage of the plant be contracted; and, until it has had sufficient time to re-extend its roots, in the same ratio will be its productiveness. These reflections are offered incidentally; in order to excite a spirit of enquiry, which may lead to more accurate ideas concerning the nature of this most useful plant.

5. *The expenditure of saintfoin hay* is chiefly on turnep-sheep and horses. The *produce* one to two tons an acre.

6. *The*

6. *The expenditure of the aftergrafs* is principally on lambs, which are newly weaned; also on grown sheep, as well as on cattle; but is seldom, I understand, eaten with horses.

7. *The duration of saintfoin* on the Cotswold hills is short. Seldom more than ten years: not even with the management above-mentioned, on land which has never borne saintfoin before. *This*, however, may be difficult to ascertain. It has been cultivated on these hills, it seems, the major part of two centuries. It is not likely, however, that every patch should have been hit: the shortness of its duration must therefore be given to the nature of the soil, or subsoil.

8. *Recropping with saintfoin.* The general idea seems to be, that land ought not to be recropt with saintfoin under twenty years. But, it is probable, that it cannot be cultivated, with success, after so short an interval. There is an instance of a piece of land on these hills being cropt three times with saintfoin, within memory; but the last crop was of little value: it went off in about three years. Therefore, notwithstanding what has been said above, the present proportion of saintfoin ley to the

arable crops may be sufficient. In the present course of crops, each piece will come round for saintfoin in seventy years: and it appears doubtful whether, even after that interval of rest, the substrata will be sufficiently recharged to send up ten more crops, equal to those at least which it afforded the first time. The food of saintfoin it then contained might have been some thousand years in forming.

2. RAYGRASS. Next to saintfoin; raygrass is here in the highest esteem. I have observed no other district in which it is so well understood, and so judiciously managed, as it is in this. Not only the green herbage, but the hay of raygrass is here considered as superiorly nutritious. The greatest *proof* I have ever met with in *grazing*, of any kind, was given by bullocks finished with ordinary barley and with raygrass hay. I do not mean with the *straw* of raygrass, which had stood to mature its *grain*; but with the *herbage* of raygrass, cut in a state of succulency, and properly made into *hay*.

The Cotswold farmers this year (1788) began cutting their raygrass leys about the 22 May ! *while the spikes were yet shooting*: it is true

true the season was then dry, and there was no prospect of its improving; it nevertheless was allowed, by men who best understand its nature, to be fully fit for cutting; and it is, I understand, every year cut in a similar state.

Men of observation assert that there are *two species* of raygrass now in cultivation in this district: the one annual, the other perennial. The former, the ordinary sort which is sold at the shops; the latter, raised on these hills. This is a strong evidence of the advantage to be expected from the cultivation of the *native* raygrass of a country. And every country ought, without loss of time, to set about a work which is so easy, and promises so much advantage. The sort here spoken of, as an annual, is probably *a worn out variety*; or one whose acquired habit is averse to the Cotswold soil.

3. TREFOIL. (*Trifolium procumbens*—provincially “hop clover.”) This is in good esteem: and is frequently sown among raygrass. Its hay, *when well got*, is thought to be of a superior quality.

4. WHITE CLOVER. When *pasturage* is the object, this is commonly sown among raygrass; but for *hay* trefoil alone is sown.

5. RED

5. RED CLOVER. It is observable, that, notwithstanding this plant has not been cultivated on these hills more, perhaps, than twenty or thirty years, its productiveness is on the decline. In a country, however, productive of saintfoin, its loss is the less to be regretted.

XXIV. GRASSLAND. The grassy vallies, which have been mentioned, are tolerably well herbage; but are very much over-run, in patches, with the red autumnal crocus—(*colchicum autumnale*) which in many places occupies, in effect, the entire surface; and as yet no mode of extirpation has been hit upon.

These vallies are applied indifferently to hay and pasturage; but no dependence can be placed in them: in a moist season they will throw out good crops of grass: but in a dry summer they are of little value.

XXV. HORSES. Some cart horses are bred on these hills. The mares are usually worked until they drop their foals; but not while they suckle; the foals being weaned early;

early ; while there is plenty of grafs upon the ground.

XXVI. CATTLE. A good many cattle are kept in this diftrict. Some Cows are kept in the vallies ; and on the skirts of the hills there are considerable dairies.

THE SPECIES OF CATTLE are the Glocestershire, the long-horned, and a mongrel breed between thofe two.

1. Cows. In the higher townships,—more particularly, perhaps, in the township of Northleach,—cows are kept on “cow-downs” (old upland grafs) in the day, and foddered in yards, at nights, with weeds, rough grafs, or other herbage, mown in the byways and hedges. The craftsmen and farm labourers have each of them a cow: by this means they not only obtain a relief for their families ; but acquire at the fame time habits of induftry. I mention this circumftance ; as in all probability, this was, formerly, the practice in moft open upland townships, throughout the kingdom.

2. GRAZING. The fatting of cattle is not the common practice of thefe hills: nevertheless

less they may boast of at least one good gra-  
zier. \* His practice is to buy in large Welch  
bullocks, at Gloucester, in autumn and win-  
ter. He gives them the run of the straw yard  
the first winter; and summers them on raygrafs  
and clover leys,—as *companions* to his fattening  
sheep,—to eat off the bents of raygrafs; and  
thereby not only give the sheep a freer better  
bite than they otherwise would have; but at  
the same time turns to a valuable purpose that  
which would otherwise (if not swept off with  
the fithe) remain an encumbrance to the sur-  
face. The ensuing winter, they are finished in  
stalls, with hay and secondary barley. A new,  
but an excellent practice.

His method of stall fattening merits particular  
notice. His fattening cattle are all *tied up*;—  
some in single, some in double stalls. His rea-  
son for this practice is not altogether that of  
saving room; he is clearly of opinion that  
they do better—fat faster—than bullocks which  
are kept in loose stalls †. His reasoning is  
fair; besides the indisputable advantage of  
their

\* MR. PEACEY.

† See VALE OF GLOUCESTER, Page 250.



their not being liable, in this case, to foul their meat and water ; he holds out another which is not so obvious, but may nevertheless perhaps be equally true: cattle which are tied up are more *cadish* (tamer—less wild) than those which are kept in loose stalls. A loose bullock (some loose bullocks at least) when a stranger enters the shed, or any disturbance happens in it, will rise and fly into the yard for refuge ; while a bullock which knows that he has not the power of flight will lie still and chew his cud. In the yards, loose bullocks are equally liable to disturbance ; and quietness is no doubt essential to quick fattening.

Each bullock has two troughs ; a small one for corn ; a large one for hay ; with a water trough, which runs the whole length of the shed, and is covered by a board ; each bullock having a hole (large enough to admit the nose) to drink at. The water trough (a hollow tree) forms, as it were, a top rail to the partition wall of the gangway. The others are beneath it ; nearly level with the bed of the stall.

The *corn* is ground, and given to them, mixt among *cut hay*, two or three times a day ;  
beginning

beginning with about half a peck, and encreasing to about a peck a day.

The method of feeding with *hay*, which in this instance is practiced, does the practitioner infinite credit. He feeds his bullocks with hay as cart horses are usually fed with corn: giving it to them *by bandfuls at once*: never more at a time than the two hands can grasp: continuing to feed them, in this manner, *until they lie down*; or until they refuse to eat. Thus they never have any hay to blow upon; (the great objection against *tying up* bullocks); even at night, they have not a mouthful left before them. The leading principle of this practice is, that fattening cattle should never be cloyed with food:—should always *eat with an appetite*. In the morning they are fed with the worst of the hay (if any difference) for being then hungry, they eat it with an appetite.—Thus the hay is eaten up clean; and the bullocks are preserved in a thriving habit; while the extraordinary expence, where a number of cattle are fatted at once, is inconsiderable. In this case it is proper to appropriate a man's time to their attendance, and he might as well be employed in *feeding them by bandfuls, until they*

*they lie down* as in cloying them with armfuls, and idling the rest of his time away.

XXVII. SHEEP. The Cotswolds have long been celebrated for their sheep; which still remain the grand object of the Cotswold husbandry. They are, here, in their proper element,

I. SPECIES. The present breed is a polled, longwooled, middlesized sheep: a breed which has been prevalent on these hills time immemorial: it has been *improved*, but has not been *changed*. Hence it is probable that the popular idea of the Spaniards' having originally procured their breed of fine-wooled sheep from the Cotswold hills has no foundation. The specific difference of the present stock from other breeds of long-wooled sheep, is that of their being fuller behind, and lighter forward, than most other breeds. The Leicestershire rams, however, having now gained a firm footing on these hills, will, of course, fill up the fore quarter. The present established breed will fat at two sheer—that is, at 3 years old—to 25 lb. a quarter wedders; 20 lb ewes; and

and cut from 7 to 9 lb of wool. Wedders generally run about three and a half to the tod.

2. REARING. Before the inclosures took place, the whole district was stocked with breeding flocks; the yearlings being sold to the graziers of Buckinghamshire, and other neighbouring counties. Still, most farmers rear their own stock.

3. FOLDING. I met with nothing on these hills which surprized me more than the almost total neglect of the sheep fold. The present breed of sheep is not adapted to folding: their legs are too short, and their wool too heavy. If a farm have a sheep down belonging to it, the hoggards (yearlings) and sometimes the sharhogs (two years old) are folded on the arable land.

4. FATTING. The sharhogs are kept, at head, in the *raygrafs* &c. *leys*, or at *vetches*, during summer, and are finished with *turneps*; eaten off in the manner already described; and with *hay*; which is given to them within the fold in bottomless racks, of a simple portable construction. Two feet high, two feet wide; and nine or ten feet long. The staves 9 inches from middle to middle:—the bottom rail

rail a slab or other board. A man, by stepping into them, moves them with great facility.

XXVIII. SWINE. The SPECIES various: the old, long, white breed seems to be in good esteem: the rind thin; and the individuals fat to a good size.

Mostly *reared* upon the hills; each farmer generally breeding his own stock.

*Fatted* chiefly on peas: some barley is given.

The *bacon* is mostly consumed on the farms: being the principal food of farmers' servants.

XXIX. RABBITS. Formerly it seems there were some warrens on these hills; but at present there are few (if any) remaining. The reason given for plowing them up is, that the rabbits were apt to break their bounds and stray over the country.

Much of the Cotswold land appears to me to be well adapted to rabbits; and where stone walls can be raised at the reasonable expence which has been mentioned, the above objection to them falls to the ground.

It strikes me, that in some situations, much of the expence of inclosing might have been saved ;—and the value of the estates, containing situations favorable to the purpose, might have been increased by the planting of rabbit warrens. Some of the few townships which still remain to be inclosed may profit by this mode of inclosure. See RURAL ECONOMY OF YORKSHIRE, article RABBITS.

XXX. LIST OF RATES. Raising *building stones* by the perch of  $16\frac{1}{2}$  square feet, 5d. to 8d. a perch.

*Slates* laid upon the roof, and plastered beneath, 26s. a square of 100 square feet.

*Stone floors*,  $4\frac{1}{2}$ d. a foot, carriage and laying included.

*Lime*, 8d. the bushel of 8 gallons level.

*Oak timber* in the stick 1s. to 15d. a foot.

*Ash timber* 1s. a foot.

*Journeyman mason's* wages 20d. a day, no beer.

*Journeyman carpenter's* 20d.

*Blacksmith's work*, for plow irons and other heavy work  $4\frac{1}{2}$ d. a lb. (Coals dear).

*Farm*

*Farm labourers*--by the day--1s. in autumn, winter and spring--14d. in hay time--18d. for mowing--2s. for five weeks certain in harvest. No beer by agreement.

*Women*, 6d. in the spring--7d. in hay time, 1s. in harvest.

*Men servants wages*--8 to 10l.

*Second men*--5 to 7l.

*Maid servant's wages* about 4l.

*Hire of a team* (5 horses, carriage, man and boy) 12 to 14s. a day.

*Price of plowing* by the acre 8s. Plowing for and harrowing in wheat 10s. 6d. an acre: the customary charge between outgoing and incoming tenant, when wheat is sown and left upon the ground.

*Hoing turneps*:--6s. an acre for two hoings, is the customary price.

*Mowing "English grass"* by the acre 20d.

*Mowing saintfoin*--according to the crop.

*Mowing raygrafs and clover*--14d. an acre.

*Mowing corn* 1s. to 14d. an acre.

*Reaping wheat* 5 to 7s. an acre.

*Thrashing wheat* 4d. a bushel (generally cut early) An instance of giving 8d. a bushel for thrashing wheat, see page 54.

*Threshing barley* 14d. to 20d. a quarter.

*Size of bushel*  $9\frac{1}{2}$  gallons, barely.

*Keep of strawyard cattle* 6d. to 1s. a-head,  
a week.

*Price of fuel:*

*Coals* by the ton 20 to 40s. according to the distance from water carriage—the price at Gloucester 13s.—at Northleach (twenty miles distant mostly back carriage) 28s.

*Wood* by the chord 20s.

*Faggots* by the hundred 24s.

T H E



T H E  
V A L L E Y  
O F  
B E R K E L E Y.

THE OUTLINES of this charming plot of country form the segment of a circle, nearer than any other regular figure. The Severn, an irregular chord :—the hills to the south and east, a curve, which the Painwick and Matson hills continue to the northern angle.

The EXTENT, from Aust cliff to the foot of Matson Hill, twenty five miles. The medium width of the district has been estimated at four miles ; but the narrowness of its extremities, I apprehend, renders that too great a medium width. Including the skirts of the hills, it may contain eighty square miles; or about fifty thousand acres.

The SURFACE of the vale of Berkeley is less uniform than that of the upper vale. The feet of the hills, in many places, stretch a considerable way toward the river; raising the surface into inequalities. Other swells rise spontaneously in the area; especially toward the extremities. In the more central part of it, however, round the town of Berkeley, there is a considerable extent of vale country. But the flatness even of this is broken, and the eye relieved, by the rising grounds of Berkeley Park, which form a hillock near its center.

The SOIL, whether it lie on the flat, or is spread over the swells, is almost uniformly rich. The more level parts are invariably covered with a deep fat loam; excepting a plot immediately above Berkley, which is clayey, cold, and less productive. The soils of some of the higher swells, too, are of a cold clayey nature. But in every part there appears, evidently, a *native unctuousness* of soil, which gives a degree of richness—*fatness*—to all its productions.

The SEVERN, here, as in the upper vale, is the common receptacle of SURFACE WATERS; which are collected by rivulets stretching

ing across the flat, and winding among the hills which back it. One of these rivulets has been rendered NAVIGABLE to Stroud and its neighbourhood: a navigation, which is now under extension toward Lechlade; to join the THAMES NAVIGATION; and thereby open a communication between these two rivers.

Out of the rivulets COMMON SHORES are sunk; and well preserved; under a COMMITTEE OF SHORES: an inquest essentially necessary to every vale country.

PRODUCE;—principally *grass*. Excepting some common fields toward the upper angle, there are not perhaps a thousand acres of *arable* land within the district. The area of the vale is likewise in a manner free from *wood*: but the sides of the hills—a calcareous soil—are mostly hung with beech; which thrives with uncommon vigour.

Placing this lovely passage of country in the light of ORNAMENT; and viewing it with a picturesque eye; it appears with singular advantages. But, to detail the views from every hillock happily placed, would be foreign to the present design. Suffice it therefore, in this place, to convey some general idea of the

scenery, in saying,—that the waters of the Severn, which here form a lengthened estuary rather than a river—(*yet winding with the utmost ease!*) are productive of infinite grandeur whenever they mix in the view:—that the surface, even of the vale, is happily broken; and *clad in perpetual verdure*: while the marginal hills not only command a near and distinct view of the vale with the Severn, as a *foreground*; and rise high enough to catch the various *distances* which surround it; but form, among themselves, scenes of superlative beauty: in general they are hung with beech of the most luxuriant growth; with cultivated vallies winding every way among them. The views from Stanchcomb Hill surpass, in *grandeur, richness, variety* and *beauty* every other circle of views I have seen.

Leaving, however, the hills and the scenery which hangs round them, until some more suitable opportunity shall offer itself, it will be proper to descend into the vale, and take a view of it as a DAIRY COUNTRY;—under which character, alone, I was led into it.

The

The objects of my attention have been

- I. Estates.
- II. Farms.
- III. Soils and management.
- IV. Water.
- V. Herbage and management.
- VI. Cows, and management.
- VII. Management of the dairy.

### I. ESTATES and MANAGEMENT.

The EARL OF BERKELEY, whose principal residence is situated near the center of the vale, is the owner of a very considerable share of it. LORD DUCIE has an estate in it. There are other off estates, and a considerable yeomanry: but what is extraordinary, considering the advantages of the situation, this vale contains few principal residences,

The RENT of land in this district is low, considering its intrinsic quality. But it is situated at a distance from market: a circumstance which influences the rental value of land as much as the quality of the land itself. Immediately round the town of Berkeley, there is land lets from 50s. to 3l. an acre. But I believe there are few *farms* of any size which are  
rented

rented higher than 25s. Perhaps 20s. may be considered as the medium rent of the district. Some of the coldest, least-productive parts are rented so low as 10s. an acre.

The TENANCY, mostly *at will: leases* are least wanted on grassland farms.

REMOVALS. Ladyday is the universal time of removal in this grassland dairy country. Mayday is objected against; because the outgoing tenant would, in this case, spring feed the mowing grounds. This, however, might be guarded against. Mayday is certainly the most eligible time of removal, on grassland estates.

II. FARMS. The SIZE of farms has of late years increased. This circumstance I have heard complained of; as increasing the the number of poor; and, in consequence, the poor's rate. Farms, at present, rise from fifty to two three or four hundred pounds a year.

The universal CHARACTERISTIC of farms, here, is *grafs*. There are many considerable farms without an acre of *arable* or *wood land* upon them. Some, however, have patches of

of arable land belonging to them. But it is, in general, used in a manner so unskilful ;— and when laid down to grafs, is laid down so shamefully,—that landlords are scarcely censurable for keeping the present undue proportion of it in a state of grafs. Indeed, while they remain satisfied with the present rents, the tenants may have no reason to complain: themselves and the community are the losers. Were a due proportion of plowland permitted, the tenants might, with judicious management, be enabled to pay a rent equivalent to the intrinsic quality of the soil. At present, the inconveniency of a want of straw must be great ; and the annual waste of hay excessive.

With respect to the PLANNING and division of farms, no regular method of laying out has, perhaps, ever been attempted ; nor have I met, in theory, with any accurate ideas on the subject. There are grounds of all sizes ; lying in every situation with respect to the homestead. It is, however, generally understood, that the cowgrounds ought to communicate with the yard, for the conveniency of milking. In the planning of these farms one important circumstance, however, seems to have been attended

attended to. The homesteads in general are situated on the farm ; not in villages, as they too frequently are, in other districts.

The FARMERIES are very simple ; and in general very mean. A small, old, timber-built dwelling-house, with a calfstage, a hovel to hold a cow occasionally, and a stable for two or three horses, are considered as the only requisites. If a cowshed be added, the farmery is complete. Were a due proportion of the lands to be broken up and kept under aration,—barns and other additional buildings would be necessary. This may be considered as a *substantial* reason for keeping them in their present state.

### III. SOILS AND MANAGEMENT.

The prevailing SPECIES of soil has been mentioned as a deep rich clayey loam. The MANAGEMENT is very simple ; even the business of *manuring* has been dispensed with, until of late years. The cows were kept, without litter, in yards and foddering grounds, and the dung suffered to waste where it dropt, or to be washed away by heavy rains.

The



The principal part, or the whole, of the lands of this vale appear to have been formerly under the plow; lying now in ridge-and-furrow; various as to height and depth. In one instance (at the foot of one of the hills) I observed the ridges, about a rod wide, laid round and high; with a slip, about a yard wide, lying flat between each of them. The ridges were covered with the finest turf, closely pastured; while the intervals were strong beds of rushes. The appearance, at some distance, was singular.

IV. WATER. The RIVULETS which cross the vale afford a supply of water to the grounds which lie near them. But many of the cow grounds appear to be deficient in good watering places.

The art of POOL MAKING does not appear to have been, at any time, studied, in these vales. The same deep, steep, narrow holes, which are observable in most old grassland districts, are common here. It is therefore probable, that the superiority of Berkeley cheese does not arise from the quality of the WATER.

V. HER-

## V. HERBAGE and MANAGEMENT.

As in the vale of Gloucester, RAYGRASS is the predominant *species*, so in this vale the DOGS-TAIL (*cynofurus cristatus*) is prevalent; with a mixture of *raygrasses*, the *poes*, and *white clover* (*trifolium repens*.) In autumn, the surface of the sounder, richer lands, is covered with one entire fleece of these excellent grasses; but chiefly of dogstail, raygrass, and the white trefoil;—the two former saccharine in a superior degree; and, in some places, as highly coloured as rank wheat in the spring.

In the richness of the soil, and the superior quality of the herbage, the superiority of the Berkeley cheese may seem to be accounted for. The fact, however, is, that, at present, the best cheese is made from the coldest, least-productive soil; and from herbage of a description very different from that which is given above. I have seen cows grazing among *rusbes*, *fleabane*, (*cineraria palustris*) *devilbit* (*scabiosa succisa*) *restbarrow* (*ononis arvensis spinosa*) and the whole tribe of weeds common to neglected cold land; with, however, an admixture of better herbage; nevertheless, from these cows, Berkeley cheese, of the first

first quality, was made. I was assured by an intelligent man, who has made a handsome fortune by cheesmaking, and who, having retired from the business, could have no motive for deceiving me,—that of two farms he occupied, one of them was well soiled and well herbage;—the other unproductive, with herbage (I speak from my own observation) of the last-given description; and that from the worst land he made, invariably, the best cheese.

It seems, indeed, to be a fact universally understood, and sufficiently established, that there is a rankness—an over-richness,—in the better lands of the vale, which renders them less fit for cheesmaking, than cooler less forcing soils: the cheeses made from them being liable to a species of fermentation—provincially termed “heaving”—a defect, which will be spoken of in its proper place: more especially when these lands are still farther enriched by *manuring*: a practice, which has, of late years, increased.

Instances are produced, in both vales, of the evil effect of MANURING COW GROUNDS: not only with *dung*; but with other manures. In the

the upper vale, *pond-mud*, for instance, was found to have a bad effect. In the lower vale, a most judicious dairywoman, speaking with concern of the decline of Berkeley cheese, accounted for it in this way. "Formerly people were used to think nothing of dung; but now every body is scraping all they can together; for since the rents have been raised they could not live if they did not help their land." The fact is, dung is found to give more grass; but injures the quality of the cheese,—during the first, and sometimes the second, year after manuring: afterwards, the evil effect wears out. Hence, judicious dairy farmers graze (that is pasture with fattening cattle) or mow (when they are permitted) the first-year after manuring. A practice which ought to be universal.

From any information which I have been able to obtain in this district, it does not appear that either a soil of superior richness, or herbage of superior fineness, is necessary to the production of cheese of the first quality. It ought to be observed, however, that the infertility of the soils which are here spoken of as unproductive, may be owing more to the retentiveness

retentiveness of the subsoil, than to the intrinsic quality of the soil itself; which may partake of the *unevenness* which has been mentioned; and which manifests itself, evidently, in soils situated on a better basis. Nevertheless, I do not find any thing in this district, which contradicts the position, that cheese of the first quality may, *under proper management*, be produced in *many* other districts of the island. Here, even on the same farm,—a change of pasture will sometimes require an alteration of management. But, by attentive practice, the proper management is hit upon, and good cheese made.

With respect to the *age* of the herbage of the Vale of Berkeley, I have met with nothing satisfactory: it may be some centuries old. But the excellency of its cheese cannot be altogether owing to the age of its turf: other districts have old grasslands: lands which have probably never been in a state of aration.

In regard to the MANAGEMENT of GRASSLAND in this district, little is to be learnt. It resembles that of the upper vale. Hay is, here, of too little value to be rigidly attended to: and pasture grounds have little attention

VOL. II. H paid

paid them; except in one particular, which ought to be copied by every district that has a pasture ground in it. The herbage of the cold, rough lands have of late years been very much improved by "skimming":—that is by mowing off the weeds and stale grass, once or twice during the summer;—a practice which cannot be sufficiently recommended. The rank deep-rooting weeds, which occupy the surface, and overshadow the tender grasses, are by this means checked, and in time destroyed; leaving the surface in the occupation of more profitable herbage.

## VI. COWS AND MANAGEMENT.

THE SIZE OF DAIRIES has of course increased with that of farms. A hundred cows are, nevertheless, considered as a very large dairy; there are few so large. Forty or fifty cows are considered as a dairy above the middle size.

THE SPECIES of cow, here, as in the upper vale, is indeterminate. *Glocestershire*, *north-country*, and a *mongrel breed*, between the two. Five years ago it was said that the north country

country cows were losing ground : and that the old stock were coming again into esteem.

I remember the observation of an experienced dairywoman in 1783 was, " that the northcountry cows neither milk so well nor fat so well as the true dark-brown Gloucestershire breed." Nevertheless I cannot perceive that they have made any progress. On the contrary the longhorned breed appear to have increased since that time.

A man whose knowledge of the rural affairs of this district, and of the several breeds of cattle of this quarter of the island, is extensive, and whose remarks are seldom superficial, sees this recent increase of the northern breed of cows in a point of view which seems to have escaped the observation of others. He is of opinion, that it has been effected by other circumstances than the comparative merits of the two breeds of cows ; which, he thinks, has had little or no influence in the change that has been taking place. He attributes it to the advanced price of dairy produce, during a succession of years last past. The DAIRY being found, in this well soiled dairy country, to pay better than BREEDING ; *this* of course declined :

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and, as the young stock diminished, the quantity of vacant pasture encreased: consequently an increase of alien cows became doubly requisite. This increase was not to be obtained from the Gloucestershire breed; nor could the supply be drawn from the kindred breeds of the neighbouring districts; nor perhaps from any other source than that from which it has been principally drawn: namely the north of Staffordshire;—where breeding is the principal object, and where the produce of the dairy is of much less value than it is in the vales of Gloucestershire.

Certain it is, that on farms whose grounds, by soil and situation, are wholly adapted to the dairy, we see the greatest proportion of north country cows; while on those which have rough or distant grounds belonging to them, adapted to breeding, the Gloucestershire cows still hold possession;—and, *by those who have them*, are still in the highest esteem.

Impressed with these ideas, the ingenious author of these remarks is of opinion, that should the dairy continue, for a length of years in its *present* declining state; especially if breeding should continue to pay so well as it  
has



has lately done ; the influx of alien cows will be stopped : their prices will no longer be a temptation to the dealers, and their places in the pastures will be occupied by rearing stock: not of the northcountry, but of the Gloucestershire breed.

Be this as it may, it is, I believe, a well known fact, that the cheese of this district has been falling off, in point of superior excellency, since about the time of the introduction of northcountry cows; and an advocate for the Gloucestershire breed would of course argue, that the northcountry cows are unfriendly to cheese. On the contrary, however, it is asserted, by those who are the best authority in this case (the cheese factors) that there are dairies consisting wholly of northcountry cows, which make cheese of the first quality. While the advocates for the breed assert, that their milk not only makes cheese of a good quality, but that it affords a greater proportion of curd, than that of the Gloucestershire breed,

Upon the whole, therefore, we have sufficient evidence, I think, to conclude, that the superior excellency of the Berkeley cheese is

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not, nor ever was, owing to the SPECIES OF COW.

The COW MANAGEMENT, here, is similar to that of the upper vale; except that a smaller proportion are *bred* in this vale: the richer lands having been considered, of late years at least, as too good for breeding. On the skirts of the hills and on the colder lands, there are, nevertheless, many breeding farms. The north country sort are bought of the jobbers at Gloucester. As they fail in their milk, they are put to fattening on the dairy farm, or sold to graziers.

A defect which has, it seems, lately crept into the management of cows in this vale is noticeable.—The cows, of many dairies, are said to come in too early in the spring: their milk is spent before the autumnal flush of grass sets in. The cool months of autumn are not only favourable to the manufacture of cheese; but the milk, of that season, is thought to yield a greater proportion of curd, than that of the summer months. I mention this as the observation of a man who is singularly entitled to attention; being intimately acquainted with every department of the dairy management of this

this country. But may not this deficiency of autumnal produce be in some measure owing to the nature of the longhorned cows ? which, though they afford a flush of milk presently after calving, are observed (the higher bred ones at least) to lose it much sooner than those of most other breeds.

VII. MANAGEMENT OF THE DAIRY. It will be proper to remark, in this place, that the HUNDRED OF BERKELEY, which forms a considerable part of the district now under survey, has ever been celebrated for the superior quality of its cheese. What, in the kingdom at large, is termed GLOCESTER CHEESE ; particularly DOUBLE GLOCESTER ; is, in Gloucestershire, called “ DOUBLE BERKELEY ” ; not more on account of the superior quality of the cheese of this district ; than because the principal part of the thick cheese of Gloucestershire is made within this hundred.

It will likewise be proper to apprise the reader, in this place, that the cheese of this district was in higher repute, some fifteen or twenty years ago, than it is at present ; as otherwise some expressions which occur would be

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obscure. It must, however, be understood that there is no cheese of the first quality now made in the vale of Berkeley; all that is meant to be conveyed, and which is acknowledged by all parties concerned, is, that the cheese of Berkeley hundred is not so *uniformly excellent* as it was some fifteen or twenty years ago.

In this case, as in that of the vale of Gloucester, on the same subject, it will be proper, before the OBJECTS be separately examined, to take a view of

|            |          |
|------------|----------|
| Managers   | Utensils |
| Dairyrooms | Milking. |

The three last, however, vary so little from the description already given of those of the upper vale, that it is unnecessary to repeat the descriptions here. Therefore, the only thing requisite, in this case, previous to an account of the particular objects, is some account of the MANAGERS of the lower vale; especially those from whom I gained my information; and whose practice I am about to register.

A superior dairywoman is so highly spoken of, and so highly valued, in this district, that one is led to imagine every thing depends upon

upon MANAGEMENT. Instances are mentioned of the same farm, under different managers, having produced good and bad cheese: even changing a dairy *maid* has been observed to make a considerable difference in the quality of the produce.

On the other hand, it has likewise been frequently seen that the same managers; the same dairywoman, the same assistants, *and the same cows*, which on one farm produced cheese of the first quality; have not, on being transferred to another, been able, on their first removal, (at least) to produce marketable cheese. Indeed, it seems to be generally understood throughout the two vales, that it is necessary "to know the ground", by two or three years experience, before good cheese can be made with any degree of certainty.

These two circumstances tend to prove the same fact: namely, that *very much* depends upon *management*.

I had an opportunity of seeing different dairies in the vale of Berkeley; and of observing the practices of different dairywomen. But the dairy which principally engaged my attention was that of *Maberley*, (near Berkeley) whose

whose manager, Mrs. WADE, whether we consider her *education*, her natural abilities, or her experience, ranks, most deservedly, among the first dairywomen of the district. Her mother was mistress of an hundred cows: herself of forty or fifty; during the last twenty or thirty years. What renders her practice, singularly valuable, is that of its being the old established practice, which brought the Berkeley cheese to its highest degree of excellency; unaltered, as that of most dairies has been, by modern deviations.

From this I was led to a modern dairy, equally distinguishable: that of Mr. BIGLAND of FROCESTER: the man most capable of giving me information, in every department of the subject I was investigating. As purchaser of, perhaps, half the cheese which is made in the vale of Berkeley, he is, of course, intimately versed in the quality of cheese.—As proprietor of a dairy of more than fifty cows, the business of a dairy farm is familiar to him. And, as a man of science, he has paid more attention to the minutiae of the art, most especially under consideration, than any other man I have conversed with on the subject,

subject. His ability of information, however, was exceeded by his liberality in communicating it. He not only gave me free admittance into his dairy; but led me over his warehouses; and, in the most disinterested manner, made me acquainted with the good and bad qualities of cheeses; of the defects they are liable to, and the excellency they are capable of.

The OBJECTS of the dairy of this district are, in species, the same as those of the upper vale: namely

|             |   |             |
|-------------|---|-------------|
| Calves      | • | Whey butter |
| Milk butter |   | Swine,      |
| Cheese      |   |             |

In the management of the two first, I met with nothing new or noticeable. The quantity of milk butter made here in summer is small. Every pound is plunder. CHEESE-MAKING was the object which led me into the district; and was the almost only subject which engaged my attention. WHEY BUTTER and SWINE will, nevertheless, require to be mentioned.

#### I. CHEESE.

I. CHEESE. The SPECIES of cheese is, in respect to *quality*, uniformly new milk—one meal—best making. But, in regard to *size*, the species varies. It is either “double” or “single:” — “thick” or “thin.”—The thin cheeses, when marketable, weigh from nine to twelve pounds each: the thick, from fifteen to twenty five pounds. The *width* of the vats is for both species the same; namely about fifteen inches; the size being varied altogether by *thickness*.

The requisite subdivisions of the subject, in this case, are the same as in the upper vale.

1. Time of making
2. Quality of milk
3. Colouring
4. Rennets
5. Running
6. Management of curd
7. Management of cheese
8. Disposal
9. Produce.

I. THE SEASON OF MAKING. “*Thin cheese*” is made from April to November: but the principal season for making “*thick cheeses*” is during



during the months of May, June, and the beginning of July. If made late in the summer, they do not acquire a sufficient degree of firmness, to be marketable the ensuing spring.

2. MILK. Here, as in the upper vale, the milk is seldom genuine: it being, I believe, a universal custom to "keep a little out."—The practice has two conveniences attending it: it brings in a little easy-got ready money to go to market with (while the tradespeople in return are furnished with better butter than otherwise they might have) and the skimmed milk is found useful in lowering the too great warmth of milk immediately from the cow. If the proportion skimmed be not great, the crime committed is venial; the milk of this country being much above par as to richness: even lowered as it is, the cheeses made from it will sometimes, in hot weather, exude an oleaginous liquid which might be collected in spoonfuls, from their surfaces.

3. COLOURING. Colouring is here considered as a thing of the first importance in the art of cheesemaking. A good material is highly valued; but is not always to be easily come

come at by dairywomen; who, perhaps, have only one market to go to. For this reason, it is here a pretty general practice for the cheese-factor to furnish the dairies, whose cheeses he expects to purchase, with colouring of the best quality.

Thus we find the *crime* of colouring cheese is not an act of darkness, done clandestinely by the dairywoman, to *deceive* the factor: but, on the contrary, an open, known department in the business of cheesemaking, to which the factor gives his assent and his assistance. The dairywoman's motive is evidently that of obliging her *customer* the *factor*. Should it be asked what can be the factor's motive for encouraging this adulteration of an article of human food,—the answer is evident: he can have no other than that of obliging *his* customers, the *cheesemongers*; who as evidently encourage this abominable practice, for the base end of obliging *their* customers,—the *consumers*.—The truth is, men in general prefer well coloured cheese to that which is ill coloured; or, in other words, highly coloured cheese is at present *fashionable*. The cheesemongers knowing this, will not purchase pale coloured cheese  
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of the factors ; and, for this reason, the factors object to a pale-coloured dairy of cheese.

In the infancy of the art, the colouring of cheese was a *crime* ; because it was then done with an intent to *deceive*. But dairywomen, at present, have no such intention. They colour it, now, through a kind of necessity, and with intentions as innocent as those of other manufacturers who change the colour of their raw materials. If the eaters of cheese were to take it into their heads, to prefer black, blue, or red cheese, to that of a golden hue, I will venture to pass my word for the dairywomen, they would do their best endeavour to gratify them.

If, in the colouring of cheese, any pernicious substance be made use of, the consequences to the community may be of a serious nature. But whether the preparation of annotta, which is now in common use for that purpose, be pernicious or salubrious to the human frame, no man perhaps has ever attempted to ascertain : it may, for any thing the declaimers against it appear to know to the contrary, be the most salutary alterative human invention can devise. It may, however,  
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be destructive to human health ; and its medical qualities ought certainly to be enquired into.\*

It appears by observations, sufficiently accurate, that one ounce, averdupois, of this preparation will colour, sufficiently, more than two hundred pounds of cheefe. The number of grains in one ounce averdupois are  $437\frac{1}{2}$ . So that each pound of cheefe, *moderately coloured*, contains two grains of the preparation.

Few men, perhaps, eat more than a pound of cheefe a day each: (I speak of men whose principal food is cheefe). It ought without dispute to be enquired into, whether two grains of that preparation, taken daily, is or is not injurious to the human frame. As to the small quantity which is eaten by men in general, on a stomach already cloyed with other aliment, it does not seem to be an object

\* It is, no doubt, a fact, that the *ANNOTTA* belongs to a class of plants, many individuals of which are of a poisonous nature. The fastidious, however, have less to fear, since the celebrated *THEA* (tea) stands not only in the same class, but in the same order, with *BIXA orellana*. See vol. i. p. 290.

ject of enquiry. If so inconsiderable a portion were capable of doing any degree of injury, thousands must long ago have been poisoned by eating cheese. It might, nevertheless, be well, both for the manufacturers and the consumers of cheese, if some regulation could be made, respecting the material of colouring.

4. RENNET. The prudent manager of the MABERLEY dairy cures her own "vells":—under a conviction, resulting from long experience, that more depends on the vell itself, than on any particular method of preparing rennet from it.

Her method of *preparing the vells* is the same as that given in the Rural Econ: of Norf: m. 108. Being first made perfectly clean by washing, they are salted, and laid down, in an earthen vessel, for a few days. They are then taken out; the first pickle drained from them: resalted; and put down in jars. She seldom uses them under one year old: she sometimes keeps them two or three years before she uses them.

Her ordinary *method of preparing her rennet* is to lay the vells in salt and water, which has been boiled with a little black pepper in it:

VOL. II.

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and to add a lemon stuck with cloves ; which (the lemon) she thinks, gives the rennet a " quickness ;" but says, that she has put the vell into a little cold water, and made as good a cheefe from it, as ever she did with prepared rennet. She never uses the vells a second time.

The rennet made use of at FROCESTER was prepared in this manner: to two gallons of water, made salt enough to bear an egg, add one pennyworth of mace,—one pennyworth of cloves,—a handful of sweet briar and hawthorn buds,—a small quantity of alum (about the bulk of a small walnut)—the same quantity of sal prunellæ,—a small quantity of cochineal (a small " pinch"—the bulk of half a hazle nut) and, if to be had, two or three bay leaves. Pound the alum, salt prunel &c. and having mixed the several ingredients with the salt and water, add five vells ; or, if small, six or seven. In about ten days, the rennet will be fit for use.

Another recipe which I was favored with, in this vale, is the following: three handfuls of common salt to three quarts of water : a quarter of an ounce of salt petre ; as much black,

black pepper as will lie upon a shilling ; a small quantity of agrimony ; a sprig of sweet-scented thyme ; a handful of sweet briar ;—a handful of the “ red buds of hawthorn ” ; four heads of sage. Add the ingredients, and boil the water a quarter of an hour. To the liquor, when cold, put one vell. The rennet may be used the next day.

I mention the different methods of preparing rennet ; because they, in reality, form a part of the practice I am registering. They are *facts* which ought not to be omitted. Nevertheless, from what I have been able to learn, from men who have an opportunity of observing the effects of different rennets, their efficacy reaches no farther than to do away the *faintness* of the vells ; and thereby render the rennet perfectly *sweet*.

5. RUNNING. It is well understood that the quality of curd varies with the degree of heat of the milk, at the time of coagulation. Milk immediately from the cow, especially in summer, is, in this district, considered as being much too warm for running ; requiring to be lowered to a desired degree of heat, before the rennet be added. If the skim milk of

the preceding meal be not adequate to this intention, *cold water* is added, to reduce it to the required heat; and no evil effect is perceived from the practice. In my own experience, cold water had, in this case, a probable bad effect. In the upper vale, I found the use of it, for this purpose, cautiously avoided. Nevertheless, in this vale, there are dairywomen of the first character, who will throw a pailful of cold water among their milk, without being apprehensive of any evil effect. It is highly probable that much depends on the specific quality of the water, used for this purpose. The water of the upper vale is not of the best quality. The waters of Cheltenham, or those of Harrowgate, might have a still worse effect.

*Maberley, 4 Oct: 1783*—half past seven, in the morning. Heat of the air in the dairy-room  $58^{\circ}$ —of the milk when stirred up with the rennet  $86^{\circ}$ —covered with cheese cloths, came at half past eight—one hour—at  $84^{\circ}$ . The curd untender.

*Note*—the small loss of heat in this instance is probably owing to the quantity of milk and the *closeness* of the morning.

*Maberley,*



*Maberley*, 4 Oct: 1783. Half past four in the afternoon. The air 62°. The milk 84°. Came at half past five—one hour—at 81½°. The curd delicate.

*Frocester*, 9 Oct: 1783. Twenty minutes before eight, in the morning. Heat of the air in the room 53°. Of the milk 81°. Covered first with cheese cloths and afterward with a thick woollen cloth. At a quarter before nine, the coagulation having then begun to take place, the surface was broken with a skimming dish, to hasten the coming. A practice not uncommon in this dairy, where the milk is run peculiarly cool. At nine, the coagulation was complete. One hour and twenty minutes. The heat of the whey 76°. The curd extremely soft and delicate.

6. THE CURD. *Maberley*, 4 Oct: 1783. Morning. The curd *broken* with a double cheese knife (similar to that described in v. i. p. 270. but with only two blades) and *also with the hand*; keeping it in motion with the dish.

In this dairy, the cheese tub is scarcely left from the time the curd comes, until it be *gathered* in a mass. As the curd settles, the dairywoman keeps collecting it, with her hands,

to one side of the cowl; carrying the mafs round the tub, from time to time, to collect the scattered curd the faster. The whey is laded off, into a large oval tub, to stand for cream. The curd being laid bare, the skirts of the mafs are cut off and piled upon the rest; at the same time gashing the body of the mafs, to let out the whey, which may have been shut up in gathering. The remaining whey is strained through a sieve, to collect the crumbs of curd; of which the Gloucestershire dairywomen are scrupulously tenacious.

The curd being thus freed from the principal part of the whey, but not yet from the whole of it; it is put into naked vats; (pressing it well in with the hands; rounding it up in the middle, in the usual way;—throwing a loose cloth over,—and tucking it in) and the vats set in the press; in order to free it the more effectually from the remaining whey.

Having stood ten or fifteen minutes in the press, it is turned out of the vats, into the cheese tub again;—broken small with the hands; and cut still smaller with the double knife.

It

It is now *scalded*, with *water lowered with whey*; about three parts water to one part whey\*. The heat, in the instance under notice, 108°. The quantity a pailful;—thrown upon the crumbled curd; and the whole stirred briskly about; mixing the curd and the scalding stuff, evenly together. The heat of the mixture 84°.

Having stood a few minutes for the curd to subside, the liquor is laded off; the curd collected; and *vatted* in this manner: an assistant takes the curd out of the tub; the manager trimming it into the vatts; both of them pressing it hard with their hands; freeing it, all they can, from the scalding liquor.

The vat about half full, a little *salt*, about an ounce, is scattered over the surface, and worked in among the curd; the vat filled up; and the mass turned two or three times in the vat; the edges being pared and the middle rounded up, each turning. At length it is turned into a cloth, in the manner which has been de-

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scribed

\* Scalding with *all whey* is in *this* district reckoned injudicious: there is an idea that "whey may be heated until it be four."

scribed in the upper vail, and placed in the press.

*Note.* In this instance, one of the vats being found too full, and another not sufficiently, a thin slice was shaved off the one and laid upon the other, without any breaking or intermixture, to make the parts incorporate.

*Maberley, 4 Oct. 1783.* Evening. The method of *breaking,—collecting,—and freeing from the whey*, the same as in the morning. The heat of the scalding liquor in this instance  $106^{\circ}$ , which was lowered by the curd to  $90^{\circ}$ , the quantity and quality nearly the same as in the morning.

*Note*,—the quantity of curd being in this instance considerably less than it was in the former, the heat of the mixture became of course greater than it was in the morning. Here lies a delicacy of management: it is not the heat of the *scalding liquid*, but that of the *mixture* which gives the texture of the curd. A circumstance this excellent dairywoman is fully aware of. She therefore keeps some of the hot liquor back; and having stirred the mixture, adds, or withholds it, as her judgement directs her: *regulating the heat of the mixture to*  
the

*the state of the curd:* thus she scalded  $84^{\circ}$ . with  $84^{\circ}$ .— $81\frac{1}{2}^{\circ}$ . with  $90^{\circ}$ .

*Frocester*, 9 Oct. 1783. The curd *broke* with a double (one-edged) knife, alone, without using the hand, immediately, in the operation; keeping it moving, as in the other instances, with the dish: the operation taking up about ten minutes.

Having stood about twenty minutes to settle, the curd was *collected* with the dish, hands, and arms, to one side of the cowl; the whey laded off; the curd collected nearer together; pressed gently in the bottom of the cowl; and put into vats and the press, to free it from the remaining whey.

*Note.* Here we have a material difference in the practices of the two vales: in the upper vale it is recommended to get the curd "hard together" with the hands in the bottom of the cowl; but subjecting it to the power of the press is a much higher kind of compression. There, the curd is, through the species of milk, leaner than it is here; where a little "fat" is not missed; and thus squeezing the curd, while soft, may, perhaps, assist in freeing

ing it from that superfluous richness which may promote its heaving.

Having remained full twenty minutes in the press, the curd was returned into the cowl, cut small with the double knife, and *scalded* with a pailful of *hot water*\*, lowered by a *dash of whey*, to  $124^{\circ}$ . which the curd reduced to  $95^{\circ}$ .

*Note.* The scalding liquor, in this instance, almost wholly water, became, after it had stood some time upon the curd, as rich to all appearance as whey: a yellow oil swimming on the surface!

7. CHEESES. 1. *Management in the press* †. *Maberley*,—having stood about an hour in the press, they are turned into finer cloths; and, about two hours afterward, *salted* the first time, and turned into the same cloths. In the evening, those made in the morning are again turned

\* If the water be suffered to *boil*, all is spoilt! How nice, or how *mysterious*, is this art.

† *Press.* The presses, which I saw in this vale, were mostly loaded with gravel, in cubical boxes, raised by rollers, and made to fall horizontally on the cheeses. The *Maberley* press is double; each division of it, holding six or eight thin cheeses. In very large dairies; especially where much thick cheese is made; three or even four presses are requisite.

turned, and again salted;—and the same repeated next morning: the surface of each cheese being salted three times, besides the little strewed among the curd. The ensuing evening they are bare-vatted; and the next morning finally taken out: each cheese standing four meals in the prefs.

The *method of salting*, in this dairy, varies from that which has been described. The cheese is salted in the vat. On taking it out of the prefs the cloth is thrown back and the upper side salted: the edges are then raised up with the cloth (one part after another) high enough above the rim of the vat to be conveniently salted:—the cheese being turned, (in the same manner as it would be if the salting were not done) the other side is salted; the cloth spread over; and the vat returned to the prefs.

*Proceſſes*;—the cheeses having stood some five or ten minutes in the prefs, they are turned into dry cloths, of the same degree of fineness as those taken off. In these, they stand in the prefs, until the next meal; when they are *salted* the first time. The second meal they are again turned into the same cloth, and salted

salted the second, which is the last, time. The third meal the cloths are taken off; the cheeses being then put into the bare vats; in which they remain so long as there is room for them in the prefs; perhaps three or four days.

*Spare curd.* I observed a different management of spare curd, here, to that described in v. i. p. 306. Here I found it cut into slices, salted, and left spread upon an inverted vat, until the ensuing meal: when it was broken and mixt promiscuously with the fresh curd. But under this management (though kept only one meal) it is found injurious to the cheese; and is therefore to be avoided with all possible care.

2. *Management on the shelves.* Where a large dairy of cows are kept, the dairyroom shelves are not sufficient to contain the young cheeses; which, in large dairies, are carried, immediately from the prefs, into an upper room, fitted up with shelves for their reception. Here they are turned, generally once a day; and remain under this treatment, until they have acquired a sufficient degree of texture, to enable them to undergo the operation of "washing": a work which is gone through every



every three, four, or five weeks, as conveniency, or want of room, may require.

3. *Cleaning.* This is done, here, in a manner fimilar to that which is described in v. i. p. 310. In some dairies, water is used ; not whey ; and in autumn, when the weather gets cold, the water is moderately warmed. Hot water is thought to soften the rind too much, and is deemed improper.

*Note.*—In the operation of washing, the firmness or solidity of the cheeses is seen in their specific gravity ; by observing which of them sink and which of them swim in the water. If they sink, they are of a sufficiently close texture : if they swim, they are “ hove ” ;—that is, either porous, or hollow in the middle. This is a very simple, and it seems, a very certain ordeal.

4. *Painting.* Cheeses rich in quality, and well manufactured ; more especially, I believe, the produce of some particular soils ; acquire, by age, a variegated colour ; particularly at and near the surface ; which becomes *clouded* with red. This natural effect is not unfrequently observable in Cheshire cheese : which being (until very lately) suffered to appear in  
its

its natural colours, the redening parts show themselves evidently, through the paleness of the ground they appear in. I have also seen an instance of this effect in some Gloucestershire cheese, of a curiously fine quality, and great age.

The exact time when the *imitation* of this natural effect took place, or by whom it was first practised, I have not been able to learn, with any degree of certainty; notwithstanding it is a late *invention*. Like the internal colouring, it probably originated in *fraud*. It was, perhaps, in the first practisers, an *artful trick*; an *imposition* on the purchaser. At present, however, it is practised through very different motives. The dairywomen, one and all, dislike it. The labour and expence of *colouring* they bestow with cheerfulness; but the act of *painting*, tho' done with less trouble and less expence, is set about with reluctance, and spoken of with disgust; especially by experienced dairywomen; who prefer the blue disk and the yellow edge to any artificial redness.

At present, the painting of cheeses is practised merely as a *characteristic*. It is done at  
the

the request of the immediate purchasers ; who cannot dispose of them (without being suspected at least of imposition) as " Gloucestershire cheese", unless they bear its characteristic.

Formerly, Gloucestershire cheese was known by the height of its internal colour. *Colouring* was then its characteristic. At length, however, the art of colouring began to travel into other districts ; it is now become in a manner general ; and colouring has not, for some years past, been characteristic of Gloucestershire cheese. The cheese of this district, however, has ever been, and probably will continue to be, in high esteem. Some evident mark, some specific character, is therefore required, by the dealer at least, to distinguish it, at sight, from that of other districts : and it may be a moot point whether the practice of *painting* originated in fraud ; or whether it was first intended to be, what it really has been, a characteristic of Gloucestershire cheese. Be this as it may, it seems to be almost certain that it will not long be able to maintain its character ; if it has not already lost it. The art of painting has begun to travel ; and will,  
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in all probability, soon become the general practice.

Thus it appears, that the Gloucestershire dairy is suffering through its own artifice. Had it not first taught the art of colouring, its cheeses might still have been distinguishable, in their native colours, by the superior blueness of their sides, and the golden hue of their edges. It likewise appears evidently, that Gloucestershire is able to give the fashion to the colour of cheese. The Gloucestershire dairywomen have therefore, now, a fair opportunity of atoning for the sins of their ancestors; and of giving a characteristic to their cheeses, which cannot be universally counterfeited: namely its own natural colour. Could they muster courage enough to leave it to nature for one season only, the characteristic would be established, and the fashion for uncoloured cheese would be set. Other districts would in consequence follow the example; and the present filthy practices be got rid of, in a way more ready and more effectual, than by any compulsory means that could be made use of. If a certain noble Earl would signify a wish that the cheeses produced upon his estate should

should appear in their NATURAL COLOURS ; his tenants love his Lordship too well ; to suffer them to go to market in any other.

5. *Management on the floor.* The cheefes being cleaned, and afterwards disguised in a way unworthy of record\*,—they are taken to the cheefe chamber ; entering what I call the *second stage*. In some dairies, the floor is prepared with succulent herbage, in the manner which has been described ; and in others it is only rubbed clean with a cloth. Cheefes bedizened in scarlet require not a blue coat: nevertheless, the succulency of the herbage is thought by some to keep the rind supple and free from cracks, and to kill or prevent mites. In the cheefe chamber, they are turned twice or three times a week, and wiped with a cloth about once a fortnight: remaining in this stage

\* Nevertheless, as an *actual operation* in the present practice of Gloucestershire, it ought to be mentioned. The *materials* Spanish brown, and Indian red ; sometimes mixed ; sometimes used separately. The *method* varies : some “ dab” on the colouring, wet, with a cloth ; others, while the surface is moist, throw it on, dry, in “ pinches”, irregularly ; rubbing it in with the hand. The latter is allowed to be the more mistressly manner.

stage until they are firm enough to set on-edge, or put into piles.

6. *Treatment of marketable cheese.*—From the “cheese chamber” they are removed into other rooms ; and placed in rows on-edge, or put into piles, of a height proportioned to their degrees of dryness. Here they remain until they are sent to market. If, in a large dairy, they do not go off regularly, at the accustomed times, every room in the house, every upper room at least, will be full of cheeses.

8. **MARKETS.** The produce of this vale, like that of the vale of Gloucester, is all purchased by what are called “cheese factors” ; though, in reality, **CHEESE MERCHANTS**. Almost the whole produce of the vale of Berkeley passes through the hands of two men: Mr. **BIGLAND** of **FROCESTER**, and Mr. **HICKS** of **BERKELEY** \*. Each purchaser has his particular dairies: which he takes, year after year, at such prices, as their several specific qualities are entitled to ; and the market price, at the time of delivery, will afford: sometimes with,  
but

\* To whom, also, I am indebted for good offices.

but frequently without, any previous bargain being made.

9. PRODUCE. Three species of produce deserve notice.

1. The produce of a given quantity of milk.
2. The year's produce of a cow.
3. The annual produce of the district.

1. *Produce of milk.* By a pretty accurate calculation, in the upper vale, I found that a cheese weighing somewhat more than 11 lb. (namely a "ten" to the cwt:) took about 15 gallons of milk (ale measure) or one gallon and one third to 1 lb. of *twomcal cheese*. From two instances, minuted with tolerable accuracy in this district, the proportion appears to be in one instance somewhat more, and in the other somewhat less than 1 lb. of curd to one gallon of *new milk*. These proportions, however, are offered merely to convey a general idea of the subject. The milk was guaged with a common rule, and the curd estimated by the vats: nevertheless, the calculations are sufficiently accurate for this intention.

2. *The year's produce of a cow.* A dairy of 40 cows made, in October, about 60 lb. of cheese a day. But the cows were then going off their milk: suppose, that in summer they produced 70 lb. a day; and calculate on seven months, at 65 lb. a day. On this calculation, the forty cows produced 121 hundredweight; or three hundredweight (of 112 lb.) each cow. A dairy of a hundred cows produced, on a par of years, five hundred pounds worth of cheese yearly. Supposing the par price was 33s. 4d. a hundred; the weight, under this supposition, was 300 cwt: or, as before three hundredweight each cow.

3. *The annual produce of the district.* In conversing on this subject, with the man best able to adduce the requisite data, we were led into calculations; which, though they only prove, with respect to the annual produce of cheese in this district, the well ascertained fact that it produces from *a thousand to twelve hundred tons a year*; yet, in other respects, they are interesting; and place the RURAL ECONOMY of the district, as a DAIRY COUNTRY, in a more striking point of view, than could



could, perhaps, be effected by any other means.

The general mode of calculation, here, is by the rent of the land: reckoning that the cheese should, at 30s. a hundred weight, pay the rent of the land occupied by the cows. The vale has been already estimated at 50,000 acres. But it contains two or three arable townships; the roads &c. are also included in this number: supposing three-fourths of it to be grassland in the occupation of dairy-farmers; and supposing the rent of grassland, taken acre with acre, to be 20s. an acre; which is understood to be at present near the truth\*; the rental value of the dairy farms of the vale is 37,500l. A thousand tons at 30l. a ton produce 30,000l. Twelve hundred 36,000l.

To bring the calculation within narrower compass, and to establish it on better-known data, a particular township was fixt upon. This township contains 2,000 acres; and makes, on a par, fifty tons of cheese a year. But, being a marginal township, part of the land

\* These calculations were made in 1783.

land is *arable*, and some young stock are reared in it. Deducting one fourth for arable land, rough grounds &c. the remainder is 1500 acres of dairy-farm land. The medium rent of these 1500 acres is laid at 20s. an acre, or 1500l. Fifty tons of cheese at 30l. a ton produce 1500l.

It also comes out, by the last calculation, that if 1500 acres produce 50 tons of cheese, each acre produces 75 pounds weight.

To estimate the proportion of cows to acres, a farm of 100 acres, grazed wholly by cows, was chosen. This farm maintains twenty five cows, summer and winter. Each cow, therefore, occupies four acres. Four acres, at 75lb. of cheese an acre, produce 300lb: which, being the produce of a cow in this calculation, is 36lb. less than the estimated produce of a cow in the calculation foregoing, on that subject.

If, as in the first calculation, we estimate the medium produce of the vale at 1100 tons, and the quantity of land occupied by cows at 37,500 acres, it follows, that each acre produces only 65lb: consequently, on this calculation,

lation, each cow occupies more than five acres of land of a middle quality.

It is, however, sufficiently ascertained, by annual experience, that three hundredweight of cheese may be taken as a fair estimation of the produce of a cow. From two hundred and a half to three hundred and a half, according to a variety of circumstances, includes, perhaps, the produce of every dairy in every year. It appears to be likewise sufficiently ascertained, by a long course of experience, that the aggregate produce of the district, is, on a par of years, eleven hundred tons. Hence it follows, on these premises, that the number of cows applied to the purpose of the dairy is seven thousand three hundred and odd. Consequently, if we allow four acres to a cow, the number of acres appropriated to the dairy, in this district, is somewhat less than thirty thousand.

But the hundred acres, on which the above calculation was founded, are above par as to quality; and it is probable that, on a par of land each cow occupies more than four acres.

On the whole we may venture to set down, in numbers sufficiently accurate to convey ge-

neral ideas;—that the vale contains fifty thousand acres of surface;—that *two thirds* of it are occupied by *cows*; that the cows are in number from seven to eight thousand; and that their annual produce of cheese is from one thousand to twelve hundred tons.

IV. WHEY BUTTER. The butter made from the rich wheys of this district is of a good quality: if well manufactured, and eaten while fresh, it is superior to the milk butter of many districts. Indeed, it is here equivalent, in price, to milk butter; not more, I understand, than a penny or twopence a pound difference. I met with an instance, in which they were both of them contracted for, by the year, by the same person; the milk at 7½d. the whey at 6½d. a lb. It is not unfrequently sold at 7d. or 8d. a lb. (of 18 oz.)

The principal *market* is Dursley; where it is bought up, chiefly, by hucksters for Stroud, and the manufacturing country which surrounds it. This accounts for the demand and the price.

The *produce* of whey butter is laid at half a pound a cow a-week. But I have known an instance, in which a pound a week has been made,

made. And, perhaps, three quarters of a pound may be taken as the medium produce of each cow. Consequently, the aggregate produce of the district is upwards of five thousand pounds a week. A quantity, which could not well be disposed of, at any price, were it not for the circumstance of a manufacturing district being situated in its immediate neighbourhood.

I have been told that it is, or has been, a custom, in some dairies, to give the whey butter as a perquisite, or as wages, to the manager. But this is evidently injudicious; as it induces her to impoverish the curd, to enrich herself. Besides, where a large number of cows are kept, the aggregate value of the whey butter, in the course of the season, is considerable. Suppose three quarters of a pound a week at 6d, a pound, and reckoning the season seven months, the gross produce is about half a guinea each cow.

V. SWINE. *Maberley, 7 October 1783.*—The whey of this dairy is given to the hogs as fast as it is skimmed; or passes through the hog-tubs, as conveniency suits. There are now in the sties five large hogs fattening on beans  
and

and whey; and five more very large stores (of the Shropshire breed) at whey and acorns. Ten swine to forty cows. See v. i. page 317.

ACORNS are here in high esteem as a food of swine. The farmers seem to be as anxious about their acorns as their apples. They consider them as the best of fattening. They think the acorns make the bacon firm; and cause it to weigh better than bean-fed bacon!

How various are opinions, in different districts, on the same subject. In many parts of the kingdom acorns are, in a manner neglected as hog-food; and are seldom considered as an eligible material of fattening. They are thought to make the bacon *hard*: here they only make it *firm*. Does the whey take off the astringent quality of the acorns? Or are the acorns of this district of a more fattening quality than those of the rest of the kingdom?

The price of acorns, here, is 1s. 6d. to 2s. a bushel; according to the season; and according to the price of beans. But few are sold. Every farmer collects his own, or tends his

his pigs upon them. In one instance I saw the wash carried, in a barrel-cart, into the center of the grounds; by the side of a haystack; under which the pigs rested.

Acorns are this year (1783) unusually plentiful. Several trees have broken down with them. I have seen one bending like an apple or pear tree under its load. Do not these circumstances evince a singular fruitfulness of soil; and show the peculiarly fattening quality of the products of these vales?

N O R T H

# N O R T H

## W I L T S H I R E.

THE DISTRICT which bears this name is an extensive tract of middleland country; lying, in a vale-like flat, between the hills of Wiltshire and those of Gloucestershire; winding from the east toward the southwest; lying, chiefly, within the limits of Wiltshire; but extending, with its northeastern margin, into Gloucestershire.

On the east, this district has no NATURAL OUTLINE: the vale of White-Horse being a continuation of it in Berkshire. The southwestern extremity is closed by the hills in the environs of Bath, on the border of Somersetshire.

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The **EXTENT**, lengthway, is about thirty five miles. The mean width about fifteen: containing more than five hundred square miles. It may be estimated at three to four hundred thousand acres.

The **CLIMATURE** of North Wiltshire is forward: peas were mostly harvested; and some wheat cut; the 25th July (1788):—more than a week before the vales of Gloucestershire.

The **SURFACE** is uneven; abounding with swells and hillocks: some of them rising abruptly, and to a considerable height above the general level of the district. Bowwood rears its head above the rest. But even this lies much below the downs that overlook it. The southwest quarter, on the contrary, dips below the general level; forming a valley, which gives passage to the Wiltshire branch of the Avon.

With respect to **SURFACE WATER**;—the middle being the highest part of the general level, the district forms a kind of double vale; dipping towards each extremity; though not perceptibly, to the distant eye. Springs are abundant. Rivulets numerous and small. Those of the east end fall gently toward the  
Thames.

Thames. Those of the southwest, more rapidly into the Avon; whose bed lies low; collecting as well the springs of the vale, as those of the margins of the hills on either side. As it approaches the neighbourhood of Bath, the valley grows deeper and narrower: the character of the country changing, from a vale-like expanse, to a broken surface; a croud of hills; a style of country between the beautiful and the romantic.

The vegetable PRODUCE of this district is chiefly *grafs*. Perhaps two-thirds of it is in a state of *old grassland*: one fourth *arable*. The rest *woodland*.

The APPLICATION of the grassland is principally to cows;—whose milk is, in a manner wholly, converted into CHEESE;—the manufacturing of which was the only object that led me into the district.

NORTH WILTSHIRE CHEESE is at present, in the first estimation among those, who indulge their appetizes. It has a richness, and at the same time, a mildness, which recommends it to many, in preference to that of Gloucestershire; even of the vale of Berkeley; whose cheese, though of the first quality as to richness,

richness, has in general a sharpness, a degree of pungency, which is offensive to some palates, though coveted by others: the produce of each district may, therefore, be said to have its excellence.

To endeavour to render an account of the DAIRY MANAGEMENT of NORTH WILTSHIRE, as interesting as the subject will permit, and as intelligible as the nature of it requires, it will be necessary to examine still farther the site, or scene of management, and the elements or materials, from which the products arise, as well as the means of production; and for these purposes it will be requisite to examine, separately, the following subjects.

- I. Estates.
- II. Farms.
- III. Soils.
- IV. Water.
- V. Herbage.
- VI. Cows.
- VII. Management.

I. ESTATES. This fertile district is chiefly the property of men of large estates;  
and

and may boast of some capital RESIDENCIES. BADMINTON, the principal residence of the DUKE OF BEAUFORT, is seated on its northern margin: as BOWWOOD, the residence of the MARQUIS OF LANSDOWN, is on the southern. LORD BOLINGBROKE and SIR JAMES LONG have seats near its center. Besides these, and the residences of several GENTLEMEN, the DUKE OF MARLBOROUGH, LORD CLARENDON, and other Noblemen have off estates in different parts of the district.

The yeomanry is inconsiderable. The occupation being almost wholly in TENANTS.

The RENT of grassland is from twenty to thirty shillings an acre. Twenty five shillings may, perhaps, be taken as the present medium rent. Grassland, therefore, lets higher, here, than in the vale of Berkley: not, however, owing to its superior quality, or to its being more *dearly* rented; but to the circumstance of its having, mostly, a mixture of arable land lying among it; a circumstance, which that of the vale of Berkley is in want of.

The TENANCY of the district varies: some estates remain *at will*; while others have been long

long let under *leases*; some of them of twenty-one years.

To the honour of this district, it may, I believe, with truth be said, that although *requisite alterations* have of late years been made, little of that *oppression*, which has manifested itself in many districts, has taken place in this. The good opinion and confidence, which ought ever to subsist between landlords and their tenants, appear to be still sufficiently maintained in the district under observation.

II: FARMS: There are few districts of the island, equally habitable, equally well soiled, and principally in a state of grassland, in which farms are so *large* as in North Wiltshire. Middleland countries being early inhabited, the lands became much divided; and the distinct occupations, where they have not been designedly thrown together, still remain small. But here, farms of two or three hundred a year, are common. Some of five or six hundred. And one (at least) of seven or eight hundred a year.

The CHARACTERISTIC of farms has been intimated. Some of them are all *grafs*; but,  
VOL. II. L in

in general, they have a portion of *arable* land belonging to them : a circumstance favorable to a dairy. One of the largest dairymen in the district, who has not this advantage, not unfrequently fetches his straw for litter, six or seven miles !

From the present **PLAN** of farms in general, we may conclude, that they have long lain in their present form, and are not recent aggregations of farm and farm. The house is generally near the center, with large cowgrounds reaching up to the yards. The grounds, too, appear to be proportioned to the sizes of the farms. On the largest, grounds of fifty acres, or more, are not unfrequent : though smaller grounds, admitting of a change of pasture, would, perhaps, be more eligible.

The **YARDS** are, in general, mere milking places ; without any shelter for cattle in winter ; when the cows (where the land will bear them) are foddered and milked abroad in the grounds. Some farms, however, especially where the soil is tender, have shedded yards : I saw one (the largest farm, I believe, in the district) which has a spacious yard, nearly inclosed

closed with sheds ; there being shed-room on the farm for near a hundred cows.

The yards are not unusually *paved*, with brick-shaped stones, set edge-way : in one instance, I found them floored with *ashes* of clods, cut out of open drains, &c. laid about a foot thick. These bind, and make an excellent bottom. If they shovel up, they are good manure. It might be good management, when materials can be had, to renew them, as they become saturated with the fertilizing quality of the dung.

### III. SOIL AND MANAGEMENT.—

The *SPECIES* of soil is various. In general, a rich, deep, productive loam. Some of the swells are of a stiffer more clayey soil ; and some of them, towards the north side of the district, of a “ brashy ” nature : appearing as detached *waves* from the Cotswold hills.—While part of the summit of one (the lovely swell on which Swindon stands) is literally a blowing sand.

The *SUBSOIL*, too, is various : in many places a *calcareous rubble*, or even a kind of *rock*, rises up to the soil, and this in the

low flat parts of the district: an uncommon circumstance. In the valley of Avon, a stratum of *gravel* intervenes between the soil and a bed of *blue marl*; which, from some experiments recently made, appears to be very beneficial to grassland; though, by analysis, it proves to be weak in calcariousity.

A district which, by natural situation, is low, and whose surface is, at the same time, raised into inequalities; especially where the substrata are of different qualities; cold springy plots will necessarily arise; and UNDERDRAINING become requisite. In this district much has been done. Toward the east end of it, *stones* are plentiful. In the valley of Avon, some *turf-drains* have been made, which thus far stand very well. I here saw an instance of sub-draining *rusby interfurrows* of high wide ridges; and with good success\*. Some yards of each furrow, which, formerly, bore nothing but rushes, or other palustrean weeds, now produce herbage equal, or nearly equal, to the rest of the land: a species of improvement, which is wanted in almost every grassland district.

\* By Mr. BRAMPS of Avon.



The MANURING of grafsland is, here, pretty common: but the ſame bad effect, on the cheefe made from land recently manured, is obſerved, here, as in the vales of Glouceſterſhire. Judicious dairymen, therefore, mow, invariably I underſtand, the firſt year after manuring.—The ſecond year they find it may be paſtured by cows with a degree of ſafety.

On a dairy farm, where cows are foddered upon the land, little manure is raiſed. The “hog pounds” are the principal ſource; and the produce of theſe, valuable as it might be made, is, I am afraid, ſuffered, in general, to run waſte into the common ſhores. One judicious manager, however, is preparing a ciſtern to receive the liquor of his hog-fties, intending to carry it out in carts, and ſcatter it upon his lands in a liquid ſtate; while another\* ſuffers it to run into a wide open reſervoir, in which mould and earth of different forts are ſhot. When theſe are ſaturated, they are carried away as manure, and freſh materials thrown in: a practice, which, I am perſuaded, will, in the end, be more beneficial

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(as

\* Mr. ISLES of Shaw.

(as the manure will be more durable) than diluting the drainage with water, and carrying it on as liquid manure.

IV. WATER. The numerous springs and rivulets, with which the district abounds, afford convenient watering places. But with respect to the *quality* of water, as a beverage for cows, from which cheese is to be made, I have not, in this district, been able to come at any information. It is a subject, which does not appear to have been thought of, much less agitated, or made the subject of observation or experiment. Intelligent dairy-men *think*, that running water *must* be best; but their opinion appears to be little better than surmise; without any solid foundation to ground it upon.

V. HERBAGE and MANAGEMENT. From a general view of the district, in the month of *July*, I could perceive no material difference, with respect to the *SPECIES* of herbage, between this district and the vales of Gloucestershire. The RAYGRASS, DOGSTAIL,  
and

and WHITE TREFOIL were then the prevailing herbage of the pasture grounds.

Here, as in the vale of Berkeley, the grasslands are mostly very old—their AGE, in general, unknown: forty years is the youngest I heard of. The entire district appears to have been heretofore under the plow; though few traces of common field are at present evident.

This district and the vale of Berkeley, which are separated by the Stroudwater hills, some eight or ten miles across, are, in many respects, similar, and different from all other districts I have hitherto examined.

The MANAGEMENT of grasslands, in this district, is similar to that of the vale of Berkeley.—The cow grounds (which are pretty universally skimmed with the sithe once, at least, in the summer) lie near the house, and the mowing grounds at a distance: the chief difference between the two districts is, that North Wiltshire abounds with “WATER MEADS,”—in situations, which will admit of this admirable improvement.

VI. COWS. The dairies of this district are large. Several, I believe, of a hundred cows

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(I saw two of this size) forty or fifty a common-sized dairy.

The SPECIES of cow is, invariably, the *longhorned*; which has here been the established species, time immemorial! I did not, at least, gain any evidence of its first introduction; or of any other species being prevalent in the district.

Many of these cows are *purchased*; but numbers are every year *bred*,—and have, time immemorial, been bred in this district; where they appear to be as fully established, as they are in Leicestershire, and the other midland counties.

The principal *place of purchase* is Highworth, near the eastern extremity of the district; to which great numbers are brought, weekly, during some months in the spring, from Staffordshire and the other midland counties. The prices given for cows, *with calves at their feet*, at that season, is extraordinary. There is one man, in the neighbourhood of Swindon, who has not given less than fifteen or sixteen pounds, or guineas, during the last ten years! From twelve to fifteen is the ordinary price. None but prime cows are brought

brought into the country. Even the Gloucester market is generally picked, by dealers, to take into Wiltshire.

The cows, which are *bred in the country*, are not inferior to those driven into it. Bulls bear a good *price*; but are not let at the extravagant rate which they have of late years arisen to, in the midland counties. Mr. BADON of Deyhouse, near Swindon, has a fine dairy of three or four score cows, mostly of his own rearing. But Mr. BEAMES of Avon, near Chippenham, stands first in the district as a breeder. He has forty cows, which, in mould—though not in size—may vie with any dairy of cows the midland country can produce; and has, this season (1788) a lot of the evenest and most beautiful yearling heifers I have ever seen in any country. But he has hired bulls from the midland district; the fountain-head, at present, of this species of cattle. Nevertheless, it may be said, without risque, that, at present, no district in the kingdom, of equal extent, can show such herds of cows, whether for number or value, as are, at this time, in the district under notice.

The

THE MANAGEMENT of DAIRY COWS is much the same, here, as in Gloucestershire: except that they are, here, more generally kept out, during winter, in the open grounds; which, in general, are better able to carry them, without injury, than are those of Gloucestershire; where the subsoil is more retentive.

The hay is all carried onto the land, upon mens' backs (a laborious employment) and scattered regularly over the ground; foddering on fresh ground every day: by which means the land is equally benefitted, and the hay eaten up clean.

One particular, respecting the summer management of cows, deserves to be mentioned. It is usual for dairymen to keep a few *sheep* among their cows. About one sheep to a cow. But there are men, here, and those of the first character as dairy farmers, who object even to this small number: alleging, that a few sheep are nearly the same trouble as a flock; and that, by nibbling out the choicest herbage, they are enemies to the cheese cowl. Nevertheless, there are others of opinion, that, on very fat land, land too rich for cheese, sheep are beneficial to the dairy; and they may be  
right:

right: there certainly cannot be a more ingenious method of impoverishing the pasture of cattle, than that of mixing sheep among them.

VII. MANAGEMENT. This will require to be subdivided as in the other districts.

I. MANAGERS. Through the interest of AMBROSE GODDARD, ESQUIRE (Member for the county) who has a considerable estate lying round his residence at SWINDON; and by the assiduities of Mr. FARMER, one of the most considerable cheese factors in the district; I gained free admission to some of the first dairies in the eastern part of it: and through the obliging assistance of Mr. BEAMES of AVON, my information in the southwestern quarter was rendered equally valuable.

I had an opportunity of seeing the entire processes of six different dairies, from forty to a hundred cows each: and saw a sufficiency of others to gain a general idea of their management.

Mr. ILES of SHAW, in the Swindon quarter, who may, I believe, be called the first dairyman in the district, and who is equally able  
and

and ready to inform, was particularly obliging in shewing me his own and his neighbours management. Mrs. BADON of DEYHOUSE, near Swindon, a most experienced and intelligent manager, and whose management is, in many respects, singular, was equally liberal of information. And Mr. RICH, of FOXHAM, in the Chippenham quarter, a skilful and attentive dairyman, whose cheese has long been held in the highest estimation; and which is, in reality (this year at least) the most uniform, and the most highly flavored dairy of cheese I have any where tasted,—was not less solicitous in giving me, without reserve, the wished for intelligence\*.

## 2. DAIRYROOM.

\* One general remark, respecting the dairywomen of this district, requires to be made. It is customary, even in the largest dairies, for the ostensible manager, whether mistress or maid, to perform the *whole* operation of making cheese; except the last breaking &c. and the vatting; in which she has an assistant. But this, in a dairy of eighty or a hundred cows, is too great labour for any woman: it is painful to see it. In one instance, in this district, a man was employed in this laborious department: and, in a large dairy, it is certainly man's work. A CURD-MILL (see YORK: ECON: v. ii. p. 291.) would lessen the labour considerably.



2. DAIRYROOM. The "*deyhouses*" of this district, are spacious and commodious\*. Set round with presses and whey leads†: no shelves: the area being left free for the cows churns, &c. The floors of stone.

Cleanliness is seen in every dairy: a degree of neatness is observable in some. Every thing is conducted in a superior style. There are men of independency and spirit, who set the example. Mr. Iles's dairyroom and "*cheefe-lofts*" form an exhibition worth going some miles to see.

The North Wiltshire dairyrooms, in general, have OUTER DOORS; frequently opening under a penthouse or open leanto shed: a good convenience; affording shade and shelter; and giving

\* One for forty cows, measured 20 by 16. One for a hundred, 30 by 40; besides a back leanto for whey leads &c.

† WHEY LEADS. They have, here, a peculiarity which is noticeable. Instead of a pin or plug being made use of to stop the outlet pipe in the bottom of the lead; the pipe is furnished with a common turn-cock; and in some cases, I was told, the pipes are continued from the leads to the cistern or general reservoir; thereby saving the labour of carrying out the whey in pails. But quere, may not the whey in this case corrode the pipes and be injurious to the hogs?

giving a degree of coolness to the dairyroom. In one instance, I observed two doors: a common close-boarded door on the inside; and an open-paled gate-like door on the outside: giving a free admission of air, in close warm weather; and, at the same time, being a guard against dogs and poultry. A convenience, which would be an improvement to any dairyroom in the summer season.

3. *UTENSILS.* Similar to those of Gloucestershire. The weight of the *press* is a box filled with sand or gravel. The dimensions of one, filled with sand, was 18 inches square, by two feet two inches long, on the inside (measuring the depth of sand only). A cubical inch of the sand, when *dry*, weighs 368 grains; consequently, the whole weight of *sand* is not quite four hundred weight.

The "broad" *vats* the same dimension as those of Gloucestershire: namely  $15\frac{1}{2}$  diameter. The "loaf" vats 10 to 12 inches diameter, by four to six inches deep. The vats are mostly without holes in their bottoms; that they may retain the brine the longer.

It is observable, that the *pail* of the Avon quarter is the large one-handed pail of Gloucestershire;

cestershire ; while, about Swindon, the common pail of the southern counties (iron hooped, with an iron bow) is universally in use ; carried on yokes, in the London manner.

The *cowl* is proportioned to the size of the dairy. I measured one near four feet diameter : yet this is sometimes too small to contain the milk of the dairy. In this case, two cowls are used : and, when part of the whey is laded off, the two parcels of curd are mixt and broken together.

4. MILKING. The hours of milking are very early. In the morning, the cows are generally in the yards, by four o'clock ;—in the afternoon, by three. In some dairies, and in the middle of summer, the cows are in the yard, and the whole family up, by three o'clock in the morning ! Thus dividing the two meals equally.

The number of milkers are proportioned to the number of cows—ten cows to a milker is the general allowance. In large dairies, the principal part of the milkers are labourers, or their wives, or daughters.

The cows are milked promiscuously ; and only once over at a meal ; not *stroked* or drawn  
a second

a second time; as they are in many districts a practice, which I have not observed either in Gloucestershire, or Wiltshire.

The OBJECTS of the dairy, which, in this case, will be required to be noticed, are

Calves

Cheese.

I. CALVES. The calves, which are not reared, are fatted by *suckling*, for the London market. Mostly sent up *dead*;—cut up in quarters;—and packed in hampers with damp cloths. The common age of butchering six, seven, or eight weeks.

Here, instead of calf *pens*, or *stages*, CALF STALLS are in use. Each calf has its separate stall, about two feet wide and four feet long; just room enough to lie down; on a platform of boards or laths; with a range of troughs before their heads; with which, in this case, they stand toward the wall; tied up short, as aged cattle: a plan which might well be adopted by the suckling farmers about the metropolis. It has many advantages over the *pens* there in use.

## II. CHEESE.

II. CHEESE. The SPECIES of cheese made here are various. Early in spring, *soft* thin cheeses are made, and sent up weekly to the London market. Some dairies, it seems, put the whole, or a principal part, of their make in *nets*. But the common make of the district consists of

Thin cheese,  
Broad-thick, and  
Loaf cheeses.

The thin and the broad-thick sorts are similar to those of the vale of Berkeley; and are, I understand, sold in London as double and single GLOUCESTER. It is the narrow LOAF CHEESE, which goes under the name of NORTH WILTSHIRE cheese; and which has of late years become so high in fashion as to fetch fifteen or twenty shillings a hundredweight more, at market, than thin cheese,—of perhaps a superior specific quality!

It may reasonably be asked, why is any other species made in the district. The answer is, every one makes loaf cheeses who *can*, with any degree of *certainty*. They not only require more *skill*, and more *labour*, than thin cheeses; but it is generally believed

VOL. II. M that

that much depends upon the *ground* from which they are to be made. The fact is, I understand, that more than half the make of the district goes to market, in the form of thin cheese, which, at present, is not worth more than 27 to 28s. a cwt. while not one fourth of it is sent in loaves, which, notwithstanding the low price of cheese in general, is worth from 45 to 50s. a cwt. !

Loaf cheeses, however, have their disadvantages ; though not equal to the present disproportion of price. They require not only more labour ; but more pressroom ; and what is still more inconvenient, especially to the *necessitous*, they do not come so quick to market ; requiring a much longer time to ripen in, than thin cheeses : consequently more loftroom is likewise necessary.

Nevertheless, these inconveniences are inconsiderable, when compared with the advantage they have at market. Every man, therefore, whose skill and grounds will permit him, and who is not in necessitous circumstances, makes loaf, or *thick* cheese ; which, in general, bears a price approaching to that of loaves.

The

The MANAGEMENT now requires to be particularized.

1. SEASON OF MAKING. In large dairies, cheesmaking is continued *throughout the year*! Not only cheese for the *family*; but *factor's* cheese, also, is made through the winter season. In one dairy, I saw a very considerable parcel of broad-thick cheese, which was literally made in *winter*. Many tons of *factor's* cheese is every year made, in this district, entirely from *hay*; which, if good, is said to afford not only closer, but richer cheese, than *grass*. Winter-made cheese, however, is long in ripening, and is liable to be scurfy and white-coated. But time overcomes one of these disadvantages, and a coat of red paint the other.

2. MILK. The *specific quality* of the milk is not here debased. The milk is run neat, or nearly neat, from the cow. The Gloucestershire practice of “keeping a little out”, for milk butter, is not here in use. It is not, at least, the common practice of the country, for the cheesmakers to *sell* milk butter. In one or two instances; which I attended to more

closely, not a drop was added to the new milk neat from the cow.

3. COLOURING. The colouring of cheese has been long a practice, in this district. The oldest dairywoman I conversed with (sixty or seventy years of age) does not recollect to have seen cheese made with its natural colour. She remembers very well the introduction of the "stone colouring"; the preparation of annotta, now in use; and has herself made use of the "powder colouring"; saunders; which, she says, was usually boiled among a little milk, previous to its being put into the cowl.

At present, the material, and the method of using it, is the same as in Gloucestershire; except that a new species has lately made its appearance; giving the milk and the curd a beautiful *yellow* hue; very different from the *redness* communicated by a superfluity of the common colouring. The base appears to be annotta; the difference being in the preparation.

The colour preferred, by the cheese factors of this district, is that of well coloured bees-wax. Cheese of this colour will fetch more,  
by



by some shillings a hundredweight, than pale under-coloured cheese, or that which is too highly reddened.

4. RENNET. I met with nothing new, in this district, respecting rennets; except in one dairy; in which a peculiar mode of preparation is made use of.

The usual method is to make as much, at once, as will last several days; perhaps weeks; or the whole season. But, in this instance, it is *made fresh every day*: that is, fresh brine is added every day; and never more than two vells—here provincially “rades”—are suffered to lie in the jar at once. The older of them is marked with a skewer; and as soon as it grows stale, is taken out, and a fresh one added.

This method of preparing rennet has been now continued through two or three generations. All I can say farther of it is, that the dairy, in which it is used, produces (if any one dairy has a decided preference) the best cheese of the district: but whether from the rennet, the ground, or the management, or from the three jointly, is by no means evident.

5. **RUNNING.** The milk is universally run as it comes from the cow; or as it *happens* to be lowered by the little skimmed milk, which is put into it. Its degree of heat I never saw tried; not even with the hand! It is *said* that, in very close weather, the first milk-ing is sometimes kept in separate vessels, or spread thin in a whey lead; but in general, I apprehend, its degree of heat, during the summer season, is never attended to! A fact, which I could not have believed, had not my own observation, strengthened by the thermometer, convinced me of it. I had conceived, that the superior excellency of the Gloucestershire management consisted very much in running the milk cool; and expected to have found it run still cooler in Wiltshire. But the following memorandums, accurately taken, are a convincing proof of the contrary.

*Swindon, Monday evening (21 July 1788).*  
Heat of the air in the dairyroom  $60^{\circ}$ : milk  $87\frac{1}{2}^{\circ}$ : uncovered: came in one hour and ten minutes: whey  $85^{\circ}$ : curd of a middle quality.

*Deybouse—Tuesday evening.* Air  $63^{\circ}$ : milk  $88^{\circ}$ : not covered: came in half an hour: "too much

much rennet": whey  $86^{\circ}$ : the curd untender ; but far from being of a bad texture.

*Westleycot—Wednesday morning.* Air  $60^{\circ}$ : milk  $86^{\circ}$ : uncovered: came in three quarters of an hour: whey  $84^{\circ}$ : the curd of a good quality.

*Shaw—Wednesday evening.* Air  $62^{\circ}$ : milk  $87^{\circ}$ : not covered: came in about an hour: whey  $86^{\circ}$ : (quantity very great:) the curd of a good quality.

*Avon—Thursday evening.* Air  $60^{\circ}$ : milk  $88^{\circ}$ : closely covered with a thick woolen cloth, to make the top and the bottom come together: came in about an hour: whey  $87^{\circ}$ : the curd very good.

*Foxham—Friday evening.* Air  $60^{\circ}$ : milk  $91^{\circ}$ .! covered with a thin cloth: came in one hour: whey  $89^{\circ}$  ! Nevertheless, the curd delicately tender!!!

6. CURD. The management of the curd depends, in some measure, on the species of cheese. Thin cheese requires the least care and labour ; and thick cheese less than loaves ; which require the best skill and industry of the manager.

In this department of the cheese manufactory the North Wiltshire dairywomen excel. It appears to be their *forte*. In it they seem to think the principal art consists. It will therefore be proper to descend to its minutiae.

1. *Breaking*. This is done entirely with the hand and the dish: no knife in use, here, as in Gloucestershire. In some dairies, great caution is observed in the first fracture of the curd; which is done, either with the hand, or the dish, moved gently in the center of the cowl; dividing the curd into large fragments; so as to let out the whey, leisurely, to prevent its carrying off with it the "fat" of the curd. When the curd has sunk a little way down in the whey, it is broken more freely; and, having stood again to subside, and the clear whey on the top being laded off, it is reduced to a degree of fineness proportioned to the species of cheese. For thin cheese, it is broken as fine as curd generally is in Gloucestershire; for thick cheese, still finer; and for loaves, it is reduced, as it were, to atoms.

In some dairies, it is violently agitated among the whey, with the hands, throwing it up from the bottom of the cowl, making it  
*boil*

*boil* up at the top, like a strong spring gushing out from below the surface. This is called "beating" it: a practice which is objected to by judicious dairymen; though I see most dairymen do it, more or less, in the last breaking in the whey.

2. *Gathering.* The ordinary practice is to lade off the whey as it rises; pressing down the curd with the bottom of the lading dish; to sink it the faster, and render it the firmer.

In one instance, and this in a dairy whose practice is intitled to the first degree of attention, the curd, instead of being pressed with the back of the dish, is, while yet suspended in the whey, gathered, with the bowl of it, to one side of the cowl; first carrying it gently round the cowl to collect the curd more effectually. The whey, by this means, is got off much clearer, "greener"—than it is when the curd is pressed, in a soft pappy state; a practice, which, undoubtedly, impoverishes the cheese.

Most of the whey being got off, the cowl is heeled (in the common practice) to get the curd into a mass on one side of it. The cowl is then replaced upright; the skirts of the mass

mass cut off and piled upon the rest ; the mass gashed with a long knife ; and the whey laded off ; fopping it up dry with a cloth.

The mass of curd is now pared down slice after slice, (about an inch thick) and piled on the opposite side of the cowl ; at intervals, pressing it close with the hands, and gashing it with the knife, to let out the whey more effectually. The whole being thus gone over, the whey, which has been by this means extracted, is laded off and fopped up with a cloth, as before ; and the curd piled a *third* time ; and, in some dairies, a *fourth* time ; slicing, gashing, and pressing it with the hands ; making it, by this means, in a manner perfectly free from whey. A practice, which was new to me, and which is, perhaps, peculiar to North Wiltshire.

In one instance, and that in the practice of a most intelligent and experienced dairywoman, I observed an improvement of this method of freeing the curd from the whey. Instead of pressing the pile, at intervals, with the hands (a power which, when the quality of curd is large, has but little effect) a vat was put upon it, and loaded with cheese weights ; a cloth  
being

being spread over the bottom of the vat to prevent their sliding. As the pile was carried up or gashed, the vat was moved from part to part, so as to give an even pressure to the whole. By this means the whey is, in a manner, wholly extracted.

Some few dairies, it seems, "double press" the cheeses: that is, put the curd in the press before it be scalded, agreeably to the Berkeley practice. But it is considered as an inferior method. It certainly reduces the richness of the cheese, more than the practice which is here described; and which, alone, fell under my observation, in Wiltshire.

3. *Scalding.* The ordinary method of scalding, here, is similar to that, which has been described in the Gloucestershire practice. The mass of curd is broken, to different degrees of fineness; proportioned not to the species of cheese, altogether; but according to the skill of the dairywoman. In a first-rate dairy, making loaf cheeses, I saw it broken very roughly.

The *quality* of the scalding liquor, too, varies, here, as in Gloucestershire. Some scald  
with

with whey: some with water: others with water lowered with whey.

The *heat* of the scalding liquor likewise varies, even in the ordinary practice of the district, very considerably: not, however, as in Gloucestershire, according to the quality of the given curd; but according to the custom of the given dairy! Custom, however, which may have been founded on long experience, and may be peculiarly adapted to the *ground*, from which the curd is produced.

In the ordinary practice of the district, the North Wiltshire dairymen may be said to scald highly. Five, out of the six dairies, whose scalding liquor I tried with the thermometer, heated the *liquor* from  $102^{\circ}$ . to  $140^{\circ}$ . The heat of the *mixture*, of the liquor and curd, being from  $92^{\circ}$ . to  $110^{\circ}$ . So that, in the ordinary practice of the country, the milk is not only run, but the curd is scalded, much higher than in the vale of Berkeley. A circumstance, which I did not expect to find in North Wiltshire; whose cheese is characterized by a soft saponaceous texture; diametrically opposite to that hardness,—toughness,—which  
scalding



scalding appears to give to the curd in the first instance.

But if a degree of surprize arises from the ordinary practice of the district, an *excentric* practice, which I was favored with the inspection of, must be a matter of some astonishment. What renders this instance of practice the more interesting, is its being struck out and pursued, by one of the oldest, best-experienced, and most intelligent dairywomen I have any where conversed with. In this instance, the curd is literally *scalded*, with almost *boiling water*! namely, with boiling water qualified by a dash of cold water, before it be thrown into the cowl; to prevent its "catching the curd." The actual heat 192°.

It is proper to be understood, however, that, in this case, the curd is not *crumbled*, or broken in the usual manner, before the scalding liquor be thrown among it; but is *cut* into checkers, or dies, of about a cubical inch each; with the same knife, used in nearly the same manner, as in slicing it.

Another peculiarity of this practice is, that the curd is *salted before it be scalded*—a handfull of salt, to every cheefe, being strewed over the

the checkers, spread regularly on the bottom of the cowl, and worked in evenly among them.

This is done in conformity with the general principle of this practice: namely, "to keep the fat in the cheese;" the salt being thought to harden and close the out sides of the cubes; thereby preventing the butyraceous particles from being extracted by the scalding liquor. The fact is, the water, instead of being made as rich and thick as buttermilk, is left in the cowl, after the curd is taken from it, thinner than the clearest whey; and without a speck of oil on its surface.

In one dairy, which I had an opportunity of observing, in this district, the scalding liquor was covered with a *sheet of oil*: which might have been skimmed off its surface in quantity: while in others, whether they were scalded higher or lower than this, not a drop of oil was to be seen, though the MANAGEMENT in every respect, was similar. The GROUND, therefore, seems to be the cause of this difference; which, to me, appears to be a circumstance singularly interesting.

4. VATTING. Nor is scalding with boiling water ; cutting the curd ; and salting it before scalding ; the only peculiarities of that singular dairy. The dies of curd having been stirred among the scalding liquor, and lain a minute or two to be thoroughly heated, are taken out of the "scald" which yet retains a heat of 130°. with dishes, and immediately put into the vats, as hot as the hands can possibly bear ! They press into the vats like beeswax, that has been very much softened by heat, or as cheese, which is slightly toasted. Two or three vats being filled, they are set in a shallow tub, placed on the dairy floor, and a loaded vat put upon them, *to close the curd while warm* : in my opinion, an admirable stroke of practice : it had long struck me, in theory, as being likely to be eligible ; but was among the last things I expected to meet with in actual practice.

Thus, not only richness, and a closeness of texture are probably obtained, by this course of treatment ; but the farm, on which it is used, is considered as being difficult to make cheese from ; and it is *believed*, that the method of treatment, which is here described, is the

the means of preventing the cheefes from heaving. The fact is, the cheefe (thin cheefe) appears to be, with this treatment, above par as to quality.

The methods of *vatting* in the other dairies, which I examined, were various. In some, the scalding liquor was laded off, and the curd rebroke and *salted in the cowl*; while in others, the curd was taken warm out of the liquor, and *salted in the vat*; thin cheefe with a small handful in one layer,—thick with two small handfuls in two layers,—loaves with two handfuls in three or four layers;—spreading and rubbing in the salt evenly among the curd.

The dairy, which has been mentioned as being celebrated for cheefe of a superior quality, scalds highly (130°.) and vats the curd warm out of the scalding liquor; while it retains 105°. of heat. Nevertheless, in a neighbouring dairy, which makes very good cheefe, the curd is put cold into the vats.

What can we infer from the aggregate of these circumstances? There appears to be but one alternative. Either different grounds require very different management: or the art of cheesmaking is less mysterious, than has hitherto

thereto been imagined. To make good cheese *sometimes*, from *some grounds*, is, I believe, a very easy matter; but to make good cheese, at *all times*, and from *all grounds*, on a *certainty*, is what no person has yet been able to perform. Nevertheless, I am more and more clearly of *opinion*, that with leisure and perseverance, assisted by a degree of chemical knowledge, and a proper apparatus, this object, difficult and desirable as it may be, is attainable.

7. The CHEESE. 1. *The management of the cheeses in the press* is, here, much the same as in Gloucestershire. They are generally *salted twice*; (only one instance of the contrary;) and *remain in the press* a time proportioned to the given thickness: thin cheese, three or four meals: thick cheese, four or five meals: loaves, five or six meals.

2. *The cheeses on the shelves*. From the press they are carried into rooms, fitted up with shelves, for their reception; some of them very commodiously: an entire lining round the walls, and, perhaps, a stage or two in the middle of the room; with only gangways,  
VOL. II. N wide

wide enough to pass conveniently, between them.

On these the young cheeses remain until they be cleaned, or until the shelves be full; turning them as often as the weather and their respective ages require.

3. Their method of *cleaning* varies: in some dairies, the summer cheeses have nothing done to them; except having their edges wiped. The blue coat rises soon enough, and sufficiently, to hide their roughnesses. In others, they are only scraped, dry (by the milking man) and in others washed and brushed with a pail brush, without being scraped. I met with no instance, in which they are soaked by the hour in water, and afterwards scraped, as in Gloucestershire. Some object even to *wetting* them: all to *soaking* them: not only as making them soft, thereby checking their ripening, and backening their sale; but as being dangerous to the cheeses; which, if they have the smallest cracks, absorb the water, and receive irreparable injury.

4. No *painting*; except of winter-made cheese; which generally throws out a white scurfy coat, difficult to be got rid of, in any other

other way. These are covered with a uniform coat of paint: but the general make of the country are, as yet, permitted to go to market in their own blue coats.

5. From the shelf-room they are taken to other rooms, provincially "lofts," and spread over the floor; which is repeatedly cleaned, by rubbing it with cloths; but not *prepared* with succulent vegetables; except for old thick cheeses, in order to prevent or kill the mites, which thick cheese is liable to be infected with, before it be ripe enough for market. In this case, the leaves of the elder are, I believe, principally used.

In one dairy, (Deyhouse) I observed an admirable arrangement of cheese rooms. The shelf room is immediately over the dairyroom. And the lofts, over the shelf room; with trap-doors in each floor to hand the cheeses through. A plan which saves much awkward carriage, and might well be adopted in every dairy that will admit of it.

8. MARKET. The cheese of this district, like that of Gloucestershire, is bought up principally by FACTORS, who live in and near the district, and who send it mostly to the

London market; the younger by land, the older by water carriage. One factor (or co-partnership of factors) is said to send seven or eight hundred tons annually.

The small cheeses are generally drawn, from the larger dairies, once a month; and down perhaps to five or six weeks old. The large cheeses require a much longer time before they be marketable. The winter, and early spring make, go off in autumn: the latter make the ensuing spring.

Besides what the factors purchase, considerable quantities are still sent, annually, to READING FAIR. The distance thirty to forty miles; according to the part of the district, from which they are sent; hired waggons being employed to carry them.

The PRICE, for the last ten years, has been, for thin cheese, from 30 to 35s. a hundred. For thick 40 to 45s. For loaves 45 to 50s. At present, and last year, thin cheese has been very low: 25 to 30s. The present par price 28s. While thick cheese; and especially loaves; keep up, nearly, at their old prices. There is, at present, from 15 to 20s. a hundred difference, between the prices  
of



of thin and loaf cheeses ! Nevertheless, it has been said, and I believe with truth, that more than half the make of the district is thin cheese. A striking evidence, this, of the present imperfection of the art under consideration.

9. PRODUCE. The produce of *milk* I had not sufficient opportunity to attend to accurately. To that of *cows by the day* I was most attentive. This ran in every instance, except one, from 2lb. to 2½lb. a cow. The one exception was somewhat below 2lb.—2¼lb. has, I am told, been produced, from cows, which came well in together, and were in full milk.

The produce of *cows by the year* is, in this district, almost incredible. Three to four hundredweight a cow, is, I was assured on all hands, the common produce. Four and a half not unfrequent. Four hundred nearly the par produce. There is a well attested instance, in which a small dairyman *sold* thirty five hundred weight from seven cows ; besides what was used in his family ! But the cows were in their prime, and extraordinary milkers.

There are two reasons, why the produce of cows, in this district, exceed that of cows,

in Gloucestershire. The cows are larger, and the season of making longer: cheese is here made the year round. Whereas, in Gloucestershire, the season of making lasts little more than seven months of the twelve.

The annual *produce of the district*, has not, perhaps, been calculated: I met with no estimate of it. Supposing one third of the district to be appropriated to cows, and allow that each acre thus occupied yields one hundredweight of cheese (calculating on four acres and four cwt; to a cow) the aggregate produce is, at least, one hundred thousand hundredweight; or five thousand tons a year.

Admitting that there is a market for the whole produce of the district, in loaf cheeses, and taking the medium disparity of price between loaf cheeses and thin cheeses, to be ten shillings a hundredweight, or ten pounds a ton; and allowing that, at present, half the produce of the district is sent to market in the form of thin cheese,—North Wiltshire is sustaining, annually, a loss of twenty five thousand pounds, through the present imperfection of the art of cheesemaking.

## GENERAL

GENERAL OBSERVATIONS  
ON THE  
DAIRY MANAGEMENT  
OF  
GLOCESTERSHIRE AND WILTSHIRE.

IN THESE OBSERVATIONS, the article CHEESE will be the only object of attention.

The SPECIES OF CHEESE, produced in this island, are various. Its markets, however, are principally filled with two species: the one of a dry loose contexture, and of a rough austere flavor: the other, milder to the taste, and of a close waxlike texture. The former is sold under the name of CHESHIRE cheese; and is, I believe, chiefly the produce of that county: the latter, under the name of GLOCESTERSHIRE cheese; provided its quality entitle it to that distinction: if not, it takes, I believe, in general, the name of WARWICK-

SHIRE cheese ; but, in reality, is produced in several counties. The products of Somersetshire, Wiltshire, Berkshire, Oxfordshire, Gloucestershire, Worcestershire, Warwickshire, Leicestershire, Staffordshire, Derbyshire, and Yorkshire, are very similar:—all of them as different from the produce of Cheshire, as if they were manufactured from a different material.

It is this milder species, which is a principal article of food, of various classes of working people ; and which, therefore, claims the first and the highest attention.

GLOUCESTERSHIRE has long held a decided superiority in the production of this article of human food. At present, NORTH WILTSHIRE is a competitor, and bids fair to take the lead. In these volumes, the practices of the two counties are, I believe, accurately and, the more difficult passages, fully registered, down to their lowest minutæ.

Therefore, without any view to blazon my own industry, or to set off, unfairly, the work I am executing, I will venture to suggest, that whoever shall examine, with attention, the three separate practices, which are here registered, will know more of the subject  
under

under examination, than any individual of the two counties knew at the time of registering.

The knowledge, even of practitioners, is in a manner wholly confined to their own individual practice; or perhaps to that of some few confidential neighbours.

The manufacturing of cheese is not like the cultivation of lands. This is a *public employment*, open to any one who travels across the site of cultivation: that a *private manufactory*—a craft—a mystery—secluded from the public eye: and what may appear extraordinary, the minutæ are seldom familiar, even to the master of the dairy, in which they are practised! The dairyroom is consecrated to the sex; and it is generally understood to require some interest, and more address, to gain full admission to its rites.

The information I have been favored with, while it shews the superior skill of the Gloucestershire and Wiltshire dairywomen, and exhibits the best practice of the kingdom at this day, proves, in a striking manner, the imperfectness of the art; even in these long-experienced and enlightened districts. Gloucestershire acknowledges a degree of *decline*;  
and

and Wiltshire, notwithstanding the spirit of improvement has evidently been some time on the wing, confesses, with equal frankness, that it has not yet been able to reach any degree of *certainty*, much less *perfection*.

At present, the art is evidently destitute of principles. So far from being scientific, it is altogether immechanical. It may be said to be, at present, a knack involved in mystery. Therefore, its *fair* professors, tho' they may claim a degree of NATURAL CLEVERNESS, to which *we* have no pretension, and which, only, could have raised the art, in the extempore way, in which it is at present practised, to the height it has attained; having tried their skill, *alone*, without obtaining the requisite degree of excellency, can have no good objection, now, to let us try our *joint* endeavours. And I call upon every man of science, who has opportunity and leisure, to lend them his best assistance. And would wish to recommend to intelligent dairy farmers to be more attentive, than they appear to be at present, to what so nearly concerns their interest.

This in apology for the following observations.

In

In attending to the minutiae of different dairies, and seeing the effects of different modes of management, a variety of ideas would, of course, rise spontaneously. Some of them fancying improvements, in the particular management I was observing; and others proposing a transfer of it, to the different districts of the island. Such of them as appear to be entitled to attention, and are not interspersed in the foregoing relations, will be given in this retrospective view of the subject.

As a groundwork, it will be proper to ascertain the good and evil QUALITIES of cheese: the EXCELLENCIES to be obtained; and the DEFECTS to be avoided. In defining these, however, we must not pay regard to the palates of individuals. There is a kind of depravity in some men's tastes, with respect to the article of food under consideration, which would frustrate every attempt at definition.—We must, therefore, have an eye to those good and bad qualities of cheeses, which raise them in value, or depreciate them, at market. Qualities of which the different dealers, in this article,

article, have ideas, sufficiently accurate for our purpose.

EXCELLENCIES. Cheese of the first quality;—that which comes as near perfection, as the nature of it admits of, or as art can probably approach,—is of a close even texture; of a firm but unctuous consistency; of a mild flavor, while young; acquiring, by age, an agreeable fragrance. If a cheese of this quality be *ironed*, it has somewhat the appearance of firm butter; or of wax moderately warmed. If the plug be gently rubbed, the substance of the cheese seems to melt under the finger, which wears it down, as it would fine clay duly moistened. If the end of the plug be pinched, it yields to the pressure without crumbling; grinding down, between the fingers, to an impalpable matter—— Cheese of this description, like wine of a good vintage, improves, by age, in mellowness and flavor.

DEFECTS. The defects of cheese, in this district, are, *porousness*, *hollowness*, *dryness*; and *partial rottenness*: the *fly*,—so much to be dreaded in Norfolk,—is not *known* here!—

Where



Where maggots are thought to breed *naturally* in good cheese.

*Porousness.* The substance of cheeses, having this defect, may be sufficiently unctuous and cohesive; but the contexture is broken, by cells of different magnitudes; and the flavor invariably bad; being pungent to the taste, and offensive to the smell.

*Hollowness.* This defect appears to be, generally, though not always, produced by the same cause, operating in a different manner. In that, the expanding air is distributed: in this, it is collected: cleaving the cheese in the middle: making it bulge out; generally in the center; but sometimes partially toward one edge. The effect, too, is the same: both of them leaving, in most cases, a pungency of taste, and disagreeableness of smell; qualities, which are increased by age. Porousness seems to be a weaker effort: hollowness a higher stage of defect.

*Dryness.* The contexture of cheese, under this defect, is loose and incohesive. If a plug be drawn, it is hard and dry to the touch; and crumbles under pressure. It wants unctuousness and flavor; being insipid to the taste,

taste, and inodorous to the smell. This description of cheese is likewise liable to cleave in the middle.

"*Whey Botches*" appear on the surface; and are understood to be caused by what is called "slip-curd"—namely curd, from which the whey has not been duly expressed. This theory, however, does not appear to me to be altogether satisfactory.

The CAUSES of the other defects are important objects of enquiry.

The dryness is understood to be owing to some degree of acidity in the milk, at the time of coagulation; and may originate in other circumstances.

The cause or causes of the other defects may be still more involved in uncertainty.—Since the doctrine of airs has been agitated, a general idea has been suggested, that *fixed air* is the latent cause. But I have not met with any reason tending to explain how this fixed air is let loose; or why it should leave, invariably, a pungency of taste and rankness of smell behind it.

That an expansion of air takes place is evident; but the *efficient* cause of this expansion may

may be difficult to explain. It may, however, be taken for granted, that whatever is the *primary* cause of the pungency and rankness, which follows, is the *primary* cause of the expansion: which, indeed, is not, in this place, the object of enquiry. For it is not the expansion; but the pungency and rancidness, which constitute the defect.

To endeavour to ascertain the cause of the pungency and rancidness, I made some experiments with cheese, possessed of these qualities in a superior degree.

The specimen subjected to these experiments was of the *porous* kind. The pores or cells varying from the size of a mustard seed to that of a bean: all of them *glazed* within: and, to the naked eye, apparently *varnished* with a yellow resinous substance; but, in a glass, there appeared to be no *coat* of matter. On being scraped with the point of a needle, the insides of the cells rose in the same snowy flakes, which every other part of the substance afforded: the colour of the loosened particles purely white; notwithstanding in their consolidated state they were of a dark yellow—a wax-colour; the cheese having to all general appearance

appearance been *coloured* ; yet not a particle of the colouring material discoverable ! One minute bundle of resin-like matter, I found lodged among the substance ; but none in the cells.—The smell fetid—the taste bitter.

EXPERIMENT I. *Tenth of July, 1788.*

Placed two pieces, about a cubical inch each, in separate glasses. Covered one of them with *cold*, the other with *boiling* water.

*Eleventh of July.* The colour of the surfaces of both of them is changed. That subjected to the *cold* water is become pale : that to the *hot*, purely white. The water, in both cases, fetid. The *cold* water the *stronger*-flavored, and the higher-coloured ; the *hot*, *milder*, and paler. On the top of the *hot*, a few small particles of oil swim ; on that of the *cold* some large specks appear.

The heat of the boiling water has softened the pulp (but not the rind) of the cheese, so as to disfigure the cube, and fix it to the bottom of the glass. On pouring off the water, and raising up this piece, the part, which was in contact with the glass, is still of a yellow colour, and retains its fetid smell ; while the upper surface is pale and in a manner *scentless*.

The

The *scent* of the other piece is weakened; but much of it still remains. The *taste* of both pieces lessened; especially that of the heated piece.

EXPERIMENT II. *Eleventh July.* Covered a piece of the same specimen,—(an inch square and about a quarter of an inch thick)—with *rectified spirit of wine*. And put another piece, (a quarter of an inch cubical) into a vial of the same spirit.

*Twelfth July.* No apparent change of *colour* or *contexture*: except that the piece in the phial is somewhat paler than when it was immersed. The *glazing* on the insides of the cells is still perfect. Nevertheless, the *smell* is entirely gone; and the *taste* rendered perfectly mild: the bitterness lost. But *where* are they dissipated, or only disguised by the spirit?

EXPERIMENT. III. *Twelfth July.* Bruised some of the pulp of the same specimen (dry and hard) with the blade of an ivory knife; the granules small, but not evenly reduced. The colour after bruising, nearly white. Put equal quantities of it into three separate glasses:  
VOL. II. O covering

covering one with *cold water*—one with *boiling water*—and the third with *spirit of wine*.

*Fourteenth July.* That upon which the *spirit* was poured, underwent no evident alteration; except that it regained part of its colour. This settled down and laid close, but loose, at the bottom of the glass. The *smell* entirely fled, or disguised.

The *cold water* effected no change, even of colour. The subject would not mix freely with it. Part of it sunk; part swam on the surface. Yesterday, not having been disturbed, it afforded little or no *smell*; but this morning, on being stirred up, it proves as fetid as the original cheese. The crumbs, which now subside, have a somewhat curdlike appearance.

The *hot water* produced, immediately, a milky liquor;—which presently divided into *curd* and *whey*; exactly resembling scalded curd, with its scalding liquor standing upon it. The curd as white, almost, as snow; the water pale and oily. Yesterday, the water emitted no smell: today, the curd, which has formed itself into a compact mass at the bottom

tom of the glass—a *cake of perfect cheese curd* !  
—is in a manner *scentless*, and *tasteless*.

Thus, from the whole, and from every part of this evidence, it appears, that the immediate cause of the pungency and rancidness of cheese is an ESSENTIAL OIL; which spirit of wine *dissolves*; and which is rendered *volatile* in boiling water.

The excellencies and defects of cheese being enumerated, and the probable cause of the principal defect pointed out,—it will now be proper to view the following heads separately; examine still farther into this cause; and endeavour to point out some probable means of avoiding its evil effect: and, at the same time, to endeavour, by scattering a few rays of light on the general subject, to relieve it, in some small degree at least, from its present obscurity.

Season,  
Soil,  
Water,  
Herbage,  
Management.

SEASON. It is a fact, well established, that the season has great influence on the quality of  
O 2 cheese;

cheese ; especially on the defect more immediately under notice. In 1783, a dry hot summer, scarcely any dairy could make good cheese. In some dairies more than half the make was hollow ; and even in the best dairy I had an opportunity of examining, numbers were " eyey" : while in a common season ; and more especially in a cool summer ; the same dairy has scarcely a defective cheese.

This corroborates the idea of an ESSENTIAL OIL being the cause of the defect. It is annually proved in the practice of numbers, that plants, in general, afford a quantity of essential oil, proportioned to the warmth of the season they grow in. It is likewise known, in the dairy counties, that cheeses made from the grass of autumn seldom or ever heave. At that season the finer blade grasses are chiefly produced. Few *flowers*, or *aromatic plants*, mix with them. Besides, the weather being generally *cool*, a less proportion of oil is probably raised, at that season of the year.

SOIL. It has been observed that the best cheese is made from the least productive soils: not, perhaps, fatter than cheese made from richer more productive soils ; but freer  
from



from the defect under notice. This is accounted for in the principle laid down: the unproductiveness of the inferior soils has been said (without any regard to this theory) to be owing to their *coolness*: another striking circumstance in favor of the principles offered.

Another observable circumstance, with respect to soils, is that of their being injured by *manuring*:—it being a fact sufficiently ascertained, in each district, that close, well flavored cheese cannot be made, or is with much uncertainty produced, from land that has been recently manured. But whether the manure, itself, be the immediate cause; or whether it only change the *herbage*,—appears to be a moot point.

WATER. This is a subject to which no one seems to have paid the smallest attention. I have not been able to gather any information respecting it, which is interesting. Nevertheless, it is probable, that much may depend upon it. It seems *reasonable* that a *plenty* and *purity* of water should be conducive to the production of good cheese: it is *probable* that a *deficiency* of water may increase the proportion of acrimony in the milk.

HERBAGE. Each species of plants has its peculiar organization ; which either enables it to make choice of its food, or gives it a faculty of changing, whatever it imbibes, to its own specific nature ; or, which to me is most probable, each plant is possessed of these two powers jointly. It is evident, that the qualities of mild, sweet, bitter, acrid, and poisonous are all of them produced by different plants growing in the same soil.

By analysis, their component particles are found to be extremely different in *proportion*, at least. Thus one plant (the savin) yields a quantity of fluid essential oil more than equal to one seventh of its own weight: while another (the rose) seldom perhaps affords the proportion of one to a thousand. Hence, on the theory offered, *much—very much indeed—* may depend on the SPECIFIC QUALITY OF THE HERBAGE.

In North Wiltshire, an experienced and very intelligent dairywoman observed, that when the “crazy” (the crowfoot) is in full blow, she finds her cheese particularly inclined to heave: while a dairy farmer of the highest class, in the same district, has observed, that,  
when

when the creeping trefoil—white clover—(*trifolium repens*) has been in full blow, and in particular abundance, he has heard the loudest complaints of the licentious disposition of the cheefe.

It is not probable, that any one species of plants is the sole cause of the disorder. Almost every cheefe has its peculiar flavor, and its different degree of acrimony. Nothing is more likely to give that almost caustic quality, which some cheefes are possessed of, than the common and the bulbous crowfoots: not only their flowers, but their leaves, are singularly acrid. On the other hand, there are several circumstances which render it probable, that a redundancy of the creeping trefoil tends to aggravate the disorder. Dry seasons, by keeping the grafs short, give it an opportunity of spreading. Manure is well known to encourage it; sometimes in a singular manner. Sheep-feeding pasture grounds produces a similar effect; partly owing, perhaps, to the blade grasses being kept short; and in part to the soil being meliorated by a fresh manure: and it has been observed that a suite of cowgrounds, which have been occasionally *fed hard with sheep*, are very dif-

ficult to make cheese from : while *a few sheep among cows* may, by picking out the clover, be serviceable to the dairy.

Other plants, probably, have a bad effect ; and to ascertain them is an object worthy of attention. It is probable, however, that the mischief is effected by some common article or articles of herbage ; and not by a few *weeds* which can easily be extirpated : nevertheless, it would be useful to know, not only the herbs, but the parts of them, which cause the evil.

The *age* of herbage may likewise influence its effect. It has been generally understood, that cheese of the first quality cannot be made from *young leys* : nothing but *old turf* being esteemed equal to its production. I have been informed, however, that there is, or was, an instance, in these districts, in which good cheese was made from *fresh land* ; from land which was kept alternately in corn and grass. In my own opinion, more depends on the quality of the *subsoil*, and the *species* of herbage, than on its *age* : or, in other words, the effect appears to me to be produced by the species of herbage and the temperature it feeds

feeds in. I have traced the roots of old turf, in different parts of this district, to two or three feet deep. Here the plants, notwithstanding the subsoil may be absorbent, probably feed in a *cool* situation, undisturbed by the immediate influence of the sun, and on soils thus situated much may depend on the age of the herbage: but it strikes me that young grafs, of a proper species, may, upon *cold land*, produce good cheese, though it should feed near the surface. This, however, by the way.

From the aggregate of the foregoing evidence we may infer, that the defects of porosity and hollowness are principally owing to the SPECIES OF HERBAGE: very much, however, depending on its STATE OF GROWTH; very much on the SEASON; much on the nature of the SUBSOIL; something on the AGE OF THE SWARD; and something perhaps on the SOIL. I wish, however, to have it understood that the inference here drawn is not considered as *conclusive*: all that appears to me is its *probability*. The theory of an art is seldom brought to light in a state of perfection. It generally requires to pass, progressively,

gressively, the several stages of infancy, adolescence, and manhood; rising by slow steps to maturity.

MANAGEMENT. The present imperfection of the art stands confessed on all hands; and, even with the joint assistance of science, it may never be raised to perfection. Nevertheless, it is evidently capable of improvement, and of being raised nearer to perfection than it is at present. Different GROUNDS (a term which aptly comprehends herbage, soil, and subsoil) may require different modes of management: but so it is in the raising of corn; dissimilar soils require dissimilar treatments: yet we see fine crops of wheat growing on almost every species of soil. Coagulation appears to be a much less fickle process of nature than fermentation: nevertheless we find the art of brewing (in the larger breweries) is raised to a degree of certainty.

The milk,  
The coagulum,  
The coagulation,  
The curd, and  
The cheese

will each require to be separately examined.

THE

THE MILK. Three things are here wanted,

A test of the quality of milk ;

A mode of correcting an evil quality ;

A gauge to ascertain the exact quantity.

That some milk is sufficiently pure, to require no correction, is evident, from cheese of the first quality being made from it, genuine, as it is drawn from the cow.

In all human probability, however, the cause of the defect, more particularly under notice, is lodged in the MILK ; and a *test* to discover it would be valuable.

In the vale of Berkeley, I was told, there are dairywomen who will judge, by the *smell* of the milk, whether the curd to be produced from it will, or will not, make a heaving cheese.

This circumstance is highly probable. For, if the heaving be caused by an ESSENTIAL OIL, the *smell* is the easiest, and, perhaps, the most certain test it can be brought to. The odour of plants (in general) lies wholly in their essential oils. Draw off this, they become scentless ; the whole of their odour being found in the oil. The various *essences* of the shops are no other than the essential oils of the several plants,

plants, whose names they respectively bear.— And it appears to me more than probable, that were the effluvia which rise from milk warm from the cow, to be *concentrated*; that is, collected into a narrower compass, thereby encreasing the flavor;—the quality might be judged of with sufficient certainty. A simple apparatus might be rendered applicable to this purpose.

*Correcting.* A redundancy of odour being discovered, the means of doing it *sufficiently* away would be the great thing desirable. It is probable, that a *degree* of odour, a *due portion* of flavor, in the milk, may be necessary to the production of well flavored cheese.

If rancidity be the effect to be guarded against; and if essential oil be the cause of rancidity; an evident, and easy mode of purification presents itself.

It is well known, that all essential oils are of a volatile nature. The heat of boiling water will cause all of them to quit their native substances. Some will quit and fly off with a much lower heat. In the loose state, in which they lie in milk, they might, no doubt, be easily dissipated. Ventilation, alone, would  
probably



probably go near to effect the desired purpose. A small addition of heat would, perhaps, render it fully adequate to the intention. By an increase of heat, the end might be obtained, with a degree of certainty.

Two inconveniences would attend this mode of correction. An increase of labour; and a loss of time. But *theory* suggests another simple apparatus, adapted to common use, and manageable by the most ignorant dairy girl, which would render the extra labour and the loss of time inconsiderable, compared with the advantage to be obtained by the use of it.

In this place, it will be proper to mention an attempt, which has been made, in this district, to correct the milk: But not, from what I can learn, with much success. Before I made the foregoing experiments, it struck me, that some chemical preparation might be hit upon for this purpose;—and that which is, perhaps, most likely to effect it has been used in this instance: namely, the *vitriolic acid*: or, as it is commonly called, the *spirit*, or the *oil of vitriol*.

A dairywoman, who tried it, put about a teacupful into seventy or eighty gallons of milk

milk. But she found it interfere with the rennet, so as to disturb the "coming." That is, being a strong acid, it brought on a premature coagulation. She, therefore, laid aside the use of it. Nevertheless she, and others, who have given it a fuller trial, are of opinion, "that it helps to keep down the cheese."

This circumstance, it is observable, still farther corroborates the theory offered; and in an interesting manner; as it is an evidence, that the *beaving*--the *immediate effect*--is caused by an essential oil; a considerable portion of which the stronger acids have a power of *fixing* in a resinous state. It is, therefore, highly probable that, by a sufficient quantity of concentrated acid, the cause might be sufficiently overcome. But supposing this mode of correction to be practicable, the practice could not be recommended.

*Gauge.* At present, the proportional quantity of curd to a given quantity of milk appears to be very uncertain. A dairywoman seems to be under no certainty, until she has, as it were, measured it in the vats. Running the milk cool is thought to lessen the quantity of curd. The proportion is thought to be greater  
in

in autumn than in summer. Some cows are thought to afford more curd than others.— This is an interesting subject, and requires to be strictly enquired into.

To come at this proportion, the first thing is to ascertain the exact quantity of milk. A rod graduated to the given cowl (by an exact gallon measure) would give it at sight; without the trouble, or the danger, of calculation being incurred.

**THE COAGULUM.** Notwithstanding the stomach of the calf is the established coagulum of milk for cheese;—it may, or may not, be the best, which nature affords for that purpose. Coagulation may be produced in a variety of ways, and the best ought to be sought for. The great object seems to be to reduce the whey to the most aqueous state possible.— Not only the quantity, but the richness, and even the dietetic quality of the curd is, perhaps, given by the coagulum. The theory of coagulation appears to be, at present, imperfectly known, or not in any degree understood; though, perhaps, a subject of some importance, in medicine, as well as in rural economics.

*A test*

A *test* of the *strength* of the coagulum used ; and a *measure* to ascertain an exact *quantity* ; are much wanted : in order that a given quantity of milk might have a due quantity of *proof* coagulum assigned it. This, with a little industry, might no doubt be accomplished : and being once fixed on mechanical principles, neither time nor labour will be lost by it.

COAGULATION. The *thermometer* is a certain guide as to the heat of the milk ; as well as of the air, in which it is to be coagulated. Thus far we might, therefore, go, on mechanical principles ; and regulate the *time of coagulation*, and the *quality of the curd*—with a degree of certainty : provided the *quality of the air*, in which the curd is generated, have no influence, by its action on the process of coagulation, on the quality of the curd.

I have observed, in one or two instances, that in a *close muggy air*, the curd has appeared to come prematurely, and to be of an inferior quality. But even should this, on due enquiry, be found to be a real circumstance in the general law of coagulation, its evil effect might, perhaps, by due attention, be guarded against. If any particular species of air should  
be

be found to be conducive to good cheese;— either during the coagulation, or while the manufacture is carried on; how easily might the required atmosphere be given; either to the containing vessel, or to the room in general?

The method of *regulating the heat of the milk* may be a thing of some importance.— Water may, or may not, be proper for this purpose.

The due length of *time in coagulating* requires, likewise, to be enquired into. Perhaps a rapid coagulation, not only renders the curd tough; but, by giving a greater quantity, injures its richness. Hence, on a lean soil, it may, perhaps, require to be carried on more deliberately, than on a rich one. It will, I am persuaded, be found, on due examination, that the quality of the curd is in great part given by the PERIOD OF COAGULATION.

The *point of maturation* wants to be ascertained. I know no guide to it, at present, which can be defined with sufficient accuracy, If the curd be broken prematurely, a portion of it may be lost: if it remains too long before

fore it be broken, some worse consequence may follow. Hence, it appears to be only common prudence to keep the vessel closely *covered* during the coagulation, that the whole may reach the proper state of maturity at the same time.

**CURD.** This may be called the stage of *manufacture*. The first step toward perfection is to provide a suitable material; the next, to manufacture it in the most perfect manner.

*Separating the curd from the whey* is a point of management, on which the *richness* of the cheese, perhaps, very much depends. The object to be aimed at, in this operation, is to draw off the whey as clear—as *green*—as may be. For this reason, it ought not to be suffered to remix with the curd, after it has once been dislodged from its cells: much less to have the curd broken small among it; thereby saturating it with the richer particles. An apparatus, sufficiently manageable in common use, and one which would, probably, save much labour and much time, might, I believe, be rendered equal to this intention.—Should it be said, that what is lost to the cheese is saved in the whey,—the reply is, that the  
injury

injury does not proceed from the *quantity* lost; but from the *quality* of the entire cheese being lowered, by the loss of part of its most valuable particles. If an inferior kind of cheese be required, the milk ought to be reduced, previous to the coagulation. From the rich soils of these districts, cheese of a superior quality may be made; though the curd be impoverished in the operation of making it. But on leaner soils, not a particle of the natural richness of the milk should, in strictness, be suffered to escape among the whey.

*Scalding the curd* is an operation, which requires to be examined into. It is peculiar to this quarter of the kingdom. It may or may not be necessary to the production of cheese of the first quality. It unavoidably carries off a portion of the richer particles of the curd.—Were it not for this inconveniency, it is probable, that the cause of heaving might, by breaking the curd small, and scalding highly, be dissipated in this operation. Even when the curd is cut into cubes, we find that high scalding has a probable good effect\*. *Cutting the*

\* See NORTH WILTSHIRE, page 173.

the curd, instead of *breaking* it, certainly preserves the richness, but may prevent the free escape of the offensive matter. Nevertheless, in the instance of practice referred to, it seems to answer the purpose required by the excellent dairywoman who uses it. It has, indeed, more *ingenuity* in it than all the other operations I have met with in the art.

Another circumstance in the operation of scalding is noticeable. It seems to be indisputable, that the curd should be scalded *evenly*. But, by the present method in use, the same cowl of curd is scalded with various degrees of heat. That which the scalding liquor immediately falls upon is subjected, perhaps, to 150°. of heat; while that which is afterwards stirred up among the liquor has not, perhaps, more than 100°. This, and the practice of leaving the cowl uncovered, during the coagulation, may account for the otherwise, perhaps, inexplicable circumstance of one cheese of a good, and another of a bad quality, being made from the same cowl of curd: a circumstance, which is mentioned with confidence in different districts. If the curd be scalded, it ought, in my idea, to be plunged wholly,  
and



and instantaneously, into the scalding liquor ; and not the scalding liquor poured upon the curd, in the manner in which it is at present. Some prudent dairywomen, I have observed, lower the first dash of scalding liquor thrown in, and stir the curd up among this, before the rest be added. This lessens the evil very considerably, but may not altogether prevent it.

*Salting the curd* is a matter entitled to attention. It strikes me, that much, if not the whole, of the superior pungency, which is mostly observable in the Berkeley cheese, may be owing to the great *quantity of salt* used in that district : while the mildness of that of Wiltshire, and especially of the two-meal cheeses of the upper vale, may arise from the comparatively small quantity, which is used in these. The quantity of salt used in the lower vale is, in the established practices of the two vales, twice, or, perhaps, near three times as much as in the upper : and although, in Wiltshire, the quantity mixed with the curd be full as much as in the vale of Berkeley, that rubbed on the surface is very considerably less. This is a point of management, which experi-

ment would readily determine. Something, too, may rest with the *method of salting*.—Whether the whole should be rubbed on the *surface*; or whether it should be partly or wholly *mixt with the curd*; or communicated in the form of *brine*, is a subject worthy of enquiry.

*Correcting the curd* by some chemical preparation, so as to prevent the cheese from rising, may be practicable; but it is probable, that although the *rising* were to be prevented, some part at least of the badness of *flavor* would remain, after this mode of correction; which, in theory, is much less eligible, than that of purifying the milk, previous to the coagulation.

*The shape of the vat* is not unworthy of attention. It is observable, that cheeses shrink in width, but not perceptibly in thickness:—thus, a cheese made in a vat fifteen inches and a half wide, and an inch and a half deep, does not, at three or four months old, measure more, perhaps, than fourteen inches in diameter; yet retains a thickness equal to the full depth of the vat. This seems to be accounted for in the species of compression, to  
which

which cheefes are subjected. Curd being a substance of a tough cohesive texture, does not, like water, or other liquid “press upward, downward, sideway, every way, and equally in all directions;” but, in a vat of the ordinary form, is pressed much more downward, than it is sideway;—more flatway, than it is edgeway: hence, in drying, the cheefes shrink principally in width: and hence, *all* cheefes of the common form have a necessary propensity *to cleave in the middle*. For the edge, or outer rim, having a greater quantity of surface for the atmosphere to act upon, shrinks faster, or attempts to shrink faster, than the central parts of the disk; which, of course, acquire a natural propensity to bulge out, to allow for the contraction of the edge: while the edge acquires a similar inclination to crack, to give the requisite circumference. If, however, a cheese be of a close cohesive texture, the powers gained, by this inequality in drying, may not be sufficient to cause either of these effects. But, if it happen to be of a loose crumbly texture; or, if the texture should be broken or opened by an internal rarefaction;

it is left at liberty to act; and, in the latter case, is assisted by the internal expansion.

The degree of propensity is in proportion to the diameter of the cheese. Therefore, in this point of view, broad vats are less eligible than narrow ones.

There are, however, some strong reasons in favour of the present form of thin cheeses in these districts. If they were made narrower and of the same thickness, their number, and, of course, the labour and the requisite press room, would be greater. If their thickness were increased they would be more liable to rise, and would not be so soon ready for market, as they are at present: nor would they, perhaps, if made narrower, be so convenient to the dealers.

To the consumer, however, the present form is extremely awkward, and the cause of unnecessary waste. It appears to me that, in regard to the convenience of the consumer, no cheese should be less than three or four inches thick; nor the diameter of cheeses of that thickness, more than ten or twelve inches.

In

In North Wiltshire, we find the form of vats varying very much. The *thin* and the *broadbick* cheeses are still made in vats exactly of the Gloucestershire dimensions. But almost every dairy has vats of various forms and sizes; so that *spare curd*, a thing to be studiously avoided, is seldom heard of there.

*Vatting.* With respect to the perfect "closeness" so much admired in the texture or substance of cheese, something may depend on the vatting; or rather on the heat, at which the curd goes into the press. If the common air, which is necessarily shut up, in greater or less quantity, with the curd, be, at the time of shutting up, in a state of rarefaction, it will, as it cools, condense, and, as it were, assist the press in giving the requisite compactness. Besides, curd, like wax, is softened by warmth; becomes pliable; and may be pressed into a closer, more uniform substance, than cold curd is capable of forming. The latter part of this position never struck me so forcibly, as in seeing the actual effect of heating curd very highly, in the instance of practice I saw in North Wiltshire. See page 175.

CHEESE.

CHEESE. It is not an extraordinary circumstance for the cheeses to "*heave in the press*:" in which case, it seems, no weight is able to keep them down. They set men's laws at defiance. In this case, it is the practice of most dairymen, I believe, to take it out; break it down small, and rescald it. This, I understand, generally allays the commotion, so far as to prevent its rising in the press a second time.

The *weight of the press* may be a thing of some importance, in the manufacturing of cheese. It seems to be a fact, sufficiently established, that *net cheeses* never heave; nor are found to be "*eyey*;" but are invariably close\*. I was assured, by an authority which I have no reason to doubt, that in Wiltshire, where (as has been already said) quantities of net cheeses are made for sale, it is no uncommon circumstance to form, out of the same cowl of curd, pressed cheeses which heave, and net cheeses which are perfectly close: it is farther remarked, in that observant district, that the heavier the press is, the greater propensity

\* In making NET CHEESES, the curd is squeezed, by hand, into the nets as close and tight as possible; but receives no other compression.

penfity the cheefes have to heaving; and that filling the vats too full has a fimilar effect.— Thefe appear to me moft interefting circumftances; and fuggelt a variety of theoretic ideas; which, however, it might be imprudent to rifque on the prefent foundation.

It may be unnecellary to obferve, that an experimental enquiry into the art under confideration would be vague, without fome method of *identifying the fubjects of experiment*. Some permanent mark is requifite. Numbers are, perhaps, the beft reference. In Norfolk, I made ufe of the *numeral characters*, cut out of plate iron. Common *figures*, of the fame or other metal, would be ftill more fimple. Thefe lying upon the cheefling, while in the prefs, fink into the rind, and leave a lafting impreffion.

*The aftermanagement of the cheefe.* Perhaps the principal improvement to be made in this ftage of the art, is that of ftriking out fome practical method of HASTENING THE MATURATION OF CHEESES. Wine mixed with the curd brings on a rapid advance of ripenefs. In Gloceftershire, I had an opportunity of obferving the effect of three or four glaffes of  
white

white wine thrown partially among the curd, during the operation of vatting. In a few months, the parts which had imbibed the wine, had passed the point of maturity, and were hastening down the stage of decay ! Therefore, it is evident that, *by composition*, a species of ripeness may be rapidly brought on ; and the qualities of cheeses thus ripened, might, no doubt, be infinitely diversified. And, perhaps, by other means, the *curd alone* might be hastened to a more *natural* state of ripeness.

But enough of reflection. It is my present intention, should leisure and opportunity favor it, to pursue the enquiry, practically, at some future time. Left, however, my intention should not be accomplished, I have thought it right, in this place, to throw open, to others, the more essential part of that which I had laid up, for my own future government.

H E R E.



## HEREFORDSHIRE.

IN EXTENT, Herefordshire ranks among the smaller counties: Its OUTLINE forms nearly a circle. The mean diameter, about forty miles: including somewhat more than twelve hundred square miles, or about eight hundred thousand acres.

The SURFACE is broken in a remarkable manner. No wide open vale, nor any extensive range of hill, appears in Herefordshire. In the north-western quarter, some separated links of the Welch mountains rise above the hillocks and minor hills, which are scattered over the rest of the county; but much the greater part of it resembles the sweetly broken country in the central parts of Kent; which, as Gloucestershire, has its beautiful features; but Herefordshire may be said, without flattery, to be altogether beautiful.

The

ITS RIVER is the WYE ; which takes an extensive sweep through the southwestern quarter. From a bend toward the center of the county, the LUG,—a fine brook,—branches northward ; collecting, with its various branchlets, the waters of the north and eastern quarters of the county. Each brook, and almost each rivulet, has its “ bottom ” or valley ; with meadows in some places of considerable width ; and with meadow-banks, broken yet fertile ; steep enough to give beauty to the surface and geniality to the soil ; yet not too steep for the purposes of cultivation.

The SOIL everywhere fertile: no watery bottoms ; nor thinsoiled barren hills ; except, perhaps, in the northern and western outskirts. Every other part is uniformly productive. The eastern side of the county is mostly a stiff clay, of great strength and tenacity ; mostly red, but in some places of the ordinary colour. The western side is lighter ; but still a productive soil.

From this description, which is no way exaggerated, the county of Hereford may well be deemed a delightful land to *live* in: and it  
abounds

abounds in RESIDENCES,—*in defiance of bad roads.*

The ROADS of Herefordshire may well be proverbial, in England: they are such as one might expect to meet with, in the marshes of Holland, or the mountains of Switzerland. Even the entrance into the county,—from the foot of Mayhill to Ross;—the principal thoroughfare from London to Hereford, Herefordshire—and *part* of South Wales, would not be deemed a sufficient by-road, in many parts of the kingdom. The narrow forest lanes and hollow ways still remain: in many places it is impossible for two carriages to pass each other; while in some, the bared rock, worn into inequalities, by heavy rains, and by being travelled upon century after century, is the present turnpike road! Such a road in Yorkshire, though leading only from village to village, would be indicted: and how those who travel, at least annually, through this dangerous pass, can suffer it to remain in its present disgraceful state, can be accounted for no other way, than in their being accustomed to worse in the neighbourhoods of their residences. The lands in some parts of  
the

the county would be improved one fourth of their present value by good roads. At present, six or seven horses are necessary to drag a load of corn to market. Yet materials are singularly abundant, in almost every part of the county. A century ago, other counties lay under similar circumstances.

INCLOSURES. Herefordshire is an inclosed county. Some few remnants of common fields are seen in what is called the upper part of the county; but in general it appears to have been inclosed from the forest state; crooked fences, and winding narrow lanes.—These circumstances assist in giving badness to the roads and beauty to the country.

The PRODUCE of Herefordshire is uncommonly various: in a general view, however, it falls under the idea of a *corn country*. The bottoms, nevertheless, furnish great quantities of *grass*, and the sides of the hills luxuriate, in a singular manner, in *wood*—chiefly oak. Herefordshire, at this time, could show more YOUNG OAKS than, perhaps, any other county of the kingdom: while the immediate banks of the vallies, and the skirts of the higher hills are strewed with orchards: in some places,  
and

and seen in some directions the bosoms of the swells appear to be covered with fruit trees ; which, at the time I saw them, were covered with fruit of the finest quality.

THE OBJECTS OF HUSBANDRY are principally CATTLE, SHEEP, *swine, corn, hops\**, and FRUIT LIQUOR. The two first, and the last, were the objects, which led me, in October 1788, to an excursion into this county.

My route was *Rofs, Ledbury, Bromyard, Leominster, Weobley, Mansel, Hereford, Rofs*, which last, and its neighbourhood, I likewise visited in 1783.

\* HOPS. Considerable quantities of hops are grown in Herefordshire ; especially about Bromyard ;—in that part of the county bordering on what may be called the Hop District of Worcestershire. I wished to have made myself acquainted with the culture of hops in this part of the kingdom ; but had not sufficient leisure to pay due attention to it. The plow appears to be more freely used here than in Kent.

## CATTLE.

THE HEREFORDSHIRE breed of cattle,—taking it all in all,—may, without risque I believe, be deemed the first breed of cattle in this island.

This superior variety of the middlehorned breed has been noticed ; and its oxen minutely described \*. In general appearance, the Herefordshire cattle resemble very much those of Suffex : except in their superior size : and still more nearly the present breed of the Vale of Pickering † : notwithstanding these several districts are separated near two hundred miles every way from each other ; with other breeds of cattle intervening. Their frame is altogether *athletic*, with the limbs, in most cases, sufficiently clean, for the purpose of travelling.

\* See vol. i. p. 245.

† See YORK: ECON: vol. ii. p. 185.

ing. The form of many of them, as **BEASTS OF DRAUGHT**, is nearly complete.

Besides their superiority as beasts of draught;—and their being eligible as dairy stock (being in this respect similar to those of Gloucestershire);—the females, at least, fat kindly at an early age; the strongest proof of their excellency as **FATTING CATTLE**. I have seen three-year-old heifers of this breed—to use a familiar phrase—“as fat as mud”: much fatter than any heifers of that age, I have seen, of any other breed;—the spayed heifers of Norfolk excepted.

Viewing the Herefordshire breed of cattle in this light; which I believe to be a true one; how unfortunate, for the rural affairs of these kingdoms, has been the choice of the spirited breeders of the midland counties! The superior varieties of the midland breed, beside being beautiful in their form, are indisputably well adapted to the **GRAZIER**, when kept to a proper age: and other varieties are well enough adapted to the **DAIRYMEN**: but for the **ARABLE FARMER**, as beasts of draught, they are far inferior to many other breeds; which, with a small share of the attention and

expencc that have been bestowed on the longhorned breed, might, I am fully persuaded, have been rendered equally, or still more profitable as milking cattle and grazing stock ; and, at the same time, have been fit for the purpose of draught:—a use, for which, not the horns only, but their general frame unfits them. I have seen them no where, in common use, as beasts of draught.

Nevertheless, we see the longhorned cattle, not only in full possession of the more central parts of the island, but overrunning the marginal districts in every direction. A circumstance, which to my mind appears to be of serious importance. The working of cattle is in the way of being, perhaps irretrievably, cut off ; and, whenever the spirit of breeding shall flag, and the art fall into neglect, the intire country will be burthened with a breed of cattle, *naturally*, the worst, perhaps, it ever knew. The longhorned cattle, in a state of neglect, might, in figurative language, be called creatures without carcase ; all horns and hide. With every assistance which genius and spirit can give them, they are barely, if at all, superior, even as grazing stock, to  
other



other breeds, which have remained in a state of comparative neglect.

These observations result not from an antipathy to this breed of cattle: nor from a want of respect for its present distinguished breeders. Nor do they, I trust, originate in a want of knowledge of the breed itself. There is no other breed of which I have had so much experience. If, however, after fifteen years acquaintance, I still remain a stranger to its merits, and have in consequence formed a wrong judgement, I wish and ask to be set right.

I am the more desirous to form an accurate judgement of the longhorned breed of cattle, as I hope to have, very soon, an opportunity of digesting my ideas respecting it, and of pursuing its excellencies as far as facts will enable me. There are, undoubtedly, some varieties of it raised to an almost incredible height. And lest, infatuated with the fairness of their *form*, I may, in their praise, be led beyond truth, I have, here, compared their GENERAL NATURE, with that of a breed, which I consider as the first the island affords, that, by

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having

having a standard to refer to, I may be the better enabled to regulate my judgement.

In Herefordshire, WORKING OXEN are the principal object of breeding. Great numbers of cattle are here in use, as beasts of draught. Half the plow teams appear to be of oxen; which are, likewise, often used in carriages: The ox cart—provincially “wain”<sup>\*</sup>—is here a common implement. They are still, in general, worked double, in yoke; even in the deep-foiled parts of the district; with, however, some few exceptions.

One circumstance in the management of cattle, in this county, is to me a matter of some surprize. The spaying of female calves is not here a practice. This circumstance is the more remarkable, as the excellency of SPAYED HEIFERS, not only as beasts of draught, but as fattening cattle, is indisputable: and still more extraordinary, as, Herefordshire not being a dairy country, numbers of female calves

<sup>\*</sup> WAINS. So lately as fifty years ago, the WAIN was the only carriage of the district: there being many men, now living, who remember the first introduction of WAGGONS.

calves must every year be fattened for the butcher. How much more eligible management it might be to castrate, indiscriminately, the handsomest, and cleanest, of such males or females, not wanted for the purpose of breeding, as drop in the rearing season.

The oxen are bred, chiefly, in the north-western quarter of the county; but, more or less, in every other; except the Ryeland quarter. They are moderately worked, until they be five or six years old; at which age they are sold mostly in good condition, but some times out of the yoke, to the graziers; principally, I believe, of Buckinghamshire, Wiltshire, Warwickshire, Gloucestershire, and the neighbouring counties.

At HEREFORD FAIR the 20 October (1788) there were about a thousand head of cattle; chiefly of this breed, with a few Welch cattle. A large proportion of them were grown oxen, full of flesh, and sold, or worth at the selling prices of the day, from twelve to seventeen pounds an ox. The most *valuable* collection of cattle I have met with out of Smithfield: and by much the *finest* show I have anywhere

seen. Had they been arranged in a proper fairstead, instead of being huddled together, as they were, in the streets of the town, they would have formed a still finer exhibition\*.

\* The impropriety of continuing to shew cattle for sale in the streets of towns is evident at Hereford; whose streets having been newly paved in the London manner, the town's people, to save their windows, and to preserve a passage to their houses, very prudently run a rope on the outside of the foot-pavement; by which means the cattle are either crowded together in the middle of the street, creating a state of confusion I have nowhere else observed; or, if headed against the rope, stand with their fore feet in the kennel! An *awkwardness* which needs not to be described.

SHEEP.

## S H E E P.

HEREFORDSHIRE has been celebrated, time immemorial, for a peculiar breed of sheep—called the RYELAND breed; from an indeterminate district, in the southern quarter of the county, which goes by the name of Ryeland; on which this breed of sheep are principally reared.

The Ryeland sheep are remarkable for the sweetness of their mutton; but still more for the fineness of their wool; which may be said to rival that of the growth of Spain. If the Spaniards improved their wool, by any breed of English sheep, it was most probably by that of the Ryeland of Herefordshire; not by that of the Cotswolds of Gloucestershire.

The “Ryelanders” are a small, white-faced, hornless breed. Their form (though little attended

attended to) is often beautiful; and their flesh of the finest quality. The ewes run from nine to twelve or fourteen, the wethers from twelve to sixteen or eighteen, pounds a quarter.

In the MANAGEMENT of the storeflocks of this breed a striking peculiarity is practised. Instead of folding them in the open field, agreeably to the practice of other districts, they are generally shut up, during the night, in a building, which is provincially termed a "cot",—and the practice termed COTTING.

The cot is generally, I believe, the ground floor of a large building, which is chambered at five or six feet high. The size is, of course, in proportion to that of the flock. From those which I have measured, a yard square to a sheep may be taken as the medium allowance of room. Racks are fixed up against the walls; and, in the larger cots, some of which will cot two hundred sheep; other racks are suspended across the middle of the room, and hoisted as the dung and litter rise.

Their food in the cot is sometimes *hay*, and sometimes *barley straw*; but most commonly *peas balm*! A food, which, it seems, is particularly affected by sheep: a fact, which  
the

the rest of the kingdom does not seem to be fully possessed of. The halm, however, is not, I find, always thrashed clean; the under-ripe pods being frequently left unbroken for the sheep. The offal is strewed about as litter; and the cot cleaned out once or twice a year; or as often as necessity, or conveniency, requires. The manure is esteemed of the first quality.

The ADVANTAGES of cotting are not spoken of with sufficient clearness to recommend it, without trial on a small scale, to other districts. The advantage generally held out is, that it fines the wool; but discerning men observe that, in the same proportion as it curbs the growth of the wool, it checks the growth of the sheep; being in this effect worse than folding.

The dung is, no doubt, of great value: and I have been told, by an intelligent husbandman, that "cotted sheep never rot;"—provided they be kept in the cot in the morning, until the dew be off the grafs. This accords with the theory above offered (see vol. 1. page 210.): the warmth of the cot promotes perspiration: the dry food absorbs the superfluous

fluous moisture of the stomach; and keeping them from the grafs, until the dews be gone of it, is a still further preventive of superfluous moisture. I have, however, heard it intimated, that if ground "be given to rot," coting will not, with certainty, prevent it: nevertheless, I am inclined to believe, that coting, *properly*, would prevent it.

Ewes, when full with lamb, are seldom, I understand, cotted; but, after lambing, the cot is found highly beneficial to the young lambs; preserving them equally from cold and from vermin.

The PRACTICE OF COTTING has probably arisen in the tender nature of the Ryeland sheep, which cannot stand the fold. Attempts, it seems, have been made to fold them, but always with great injury to the flock. Housing them was, therefore, the only means of collecting their dung; and rendering them most useful in an arable country: besides preserving them from the vermin of the woodlands, with which this district has formerly abounded, and with which it still abounds.

This breed of sheep appears to be an object worthy of national attention. Large furs  
are



are annually paid to Spain for wool. The wool of the Ryeland sheep is used in the same intention, as that of Spain. Though not fine enough as an entire substitute for Spanish wool, it supplies its place, I understand, in some degree. In 1783, Ryeland wool was sold for two shillings a pound, when the ordinary wool of the kingdom was not worth more than fourpence a pound. Spanish wool was then three shillings. Ryeland wool *cotted* and *trended*\* was, this year, (1788) sold for near two shillings; and Spanish, I understand, is worth about three shillings.

It is, I believe, an inevitable consequence, that should the supply of Ryeland wool be discontinued, an increased supply of Spanish wool would be necessary. On the contrary, should the internal supply be augmented, the wants from abroad would be diminished, proportionably. Should the longwooled breed of sheep, which is now working its way into all quarters of the kingdom, gain a footing, and acquire

\* This wool appears to have been formerly considered as a national object. It is under the inspection of "sworn trenders;" who free it from dirt and offal, and make it up in trendles, or round bundles, for sale. Wool thus made up bears a price of about half-a-crown a stone (of 12½ lb.) more than wool of the same quality, in its rough state.

acquire fashion, in Herefordshire, the Ryeland breed may, in a few years, be irretrievably lost.

The farmer's object is the aggregate profit of his flock: no matter, to him, whether it arise from wool or carcase: and, if the carcase of the Ryeland sheep had not been of superior value, it is probable the breed would long ago have been extinct. For although the wool of this breed is sold at a high price, the quantity cut, from a given number of sheep, is in the inverse proportion. *Cotted* sheep seldom, I believe, afford more than a pound and a half, each sheep;—while from some breeds of the kingdom, seven or eight pounds of wool are cut,—worth, at present (1788) 8d. or 9d. a pound; or twice the value of the Ryeland coat. —The sheep of those breeds are, however, larger; but not in this proportion.

What I mean to intimate in this case is, that the continuation of the supply of Ryeland wool is, at present, in a state of uncertainty; and I leave it to those, whose province it more nearly concerns, to devise the proper means of preserving and encreasing the ENGLISH BREED OF FINEWOLLED SHEEP.

T H E

THE  
M A N A G E M E N T  
OF  
ORCHARDS AND FRUIT LIQUOR,  
IN  
*Herefordshire and Gloucestershire.*

THE CULTIVATION of FRUIT TREES, for the sole purpose of LIQUOR, is peculiar to the western provinces. The southern counties, when the London markets are overstocked with fruit, make a sort of liquor from the surplus: but the eastern, the northern, and the midland counties may be said to be as much unacquainted with the business of a liquor orchard, as they are with that of a vineyard.

yard. Even Staffordshire, which is divided from the cider country by a narrow ridge of hill only, has not, generally speaking, a barrel of cider made within it.

HEREFORDSHIRE has ever borne the *name* of the first cider county:—GLOCESTERSHIRE, however, claims a preference in the two most celebrated fruit liquors the district affords.—WORCESTERSHIRE, and MONMOUTHSHIRE have their claims of excellency. May-hill may be considered as the center of this division of the cider country\*.

FRUIT LIQUOR is here an object of RURAL ECONOMY; and, though inferior to most other of its objects, was a secondary inducement to my visiting the district. In 1783, however, I was unfortunate: it was not a general fruit year. But this year (1788) has made up for the disappointment. There are men who will this year make a hundred hogsheads, that, in 1783, did not "wet the press."

But

\* DEVONSHIRE and its ENVIRONING COUNTIES form another division; which, though upon the whole much inferior to this, produces one species of liquor (the *coccagee* cider) which is in high estimation.

But the management of orchards and their produce, though it enters into the practice of almost every occupier of land, is far from being properly understood. The primary object of farmers, in general, has been that of supplying their own immoderate consumption.—The markets for *sale* liquor has hitherto been confined. In a plentiful year it has barely paid for the *slavery* of making it. But the late extension of canals, and other inland navigations, and most especially one which is now extending between the Severn and the Thames, together with the present facility of land carriage, have already extended, and will in all probability still farther extend, the market for fruit liquor; and there may be, henceforward, some encouragement for the manufacturing of *sale* liquor; the right management of which is a *mystery*, which few men are versed in, and which I have found somewhat difficult to fathom.

I have, however, been the more diligent in my application to this subject, as it is an art which has never been duly investigated. The entire subject having never undergone an analytical examination, no man can be said to

VOL. II.

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have

have had a view of it, sufficiently comprehensive, to raise every part to the requisite degree of perfection. The "cidermen"—(the buyers of sale liquor,) are far advanced in the ordering of the LIQUOR; but are unacquainted with the management of ORCHARDS: while the occupiers of orchards are, mostly, as unacquainted with the proper management of the fruit they grow. A general view of the whole art cannot, therefore, fail of having its use; even in the cider countries.

In taking this view, it will be convenient to examine the two main branches separately; under the heads

MANAGEMENT OF ORCHARDS.

MANAGEMENT OF FRUIT LIQUOR.

## ORCHARDS.

## ORCHARDS.

UNDER THIS DIVISION of the subject, it will be proper to view, separately,

The situation of orchards.

The soil, &c. of orchards.

The method of raising stocks.

The method of planting orchards.

The method of grafting fruit trees.

The after-management of orchards.

And, previous to this detail, to examine the SPECIES OF FRUIT, which give rise to it.

In the orchards of this district, we find the APPLE, the PEAR, and the CHERRY. The last, however, is only found near towns, and in young orchards: and although it is probable, that a liquor of some richness and flavor might be made, from a well chosen variety of this species of fruit, I do not find that any attempt has been made, in this district, to pro-

duce from it a vinous liquor. Therefore, the APPLE and the PEAR, only, are here entitled to examination.

NATURE has furnished us with only one sort of each of these species of fruit: namely, the common CRAB of the woods and hedges; and the WILD PEAR, which is pretty common in the hedges of the district.

LINNEUS, *who knew all nature*, takes no notice of the APPLE. He, as well as other botanists, consider it as a production of ART: the various sorts, with which our orchards abound, being considered as no other than CULTIVATED VARIETIES of the *pyrus malus*, or CRAB: while all the rich and highly flavored PEARS, of which gardeners speak so learnedly, are considered as no other than ARTIFICIAL PRODUCTIONS, from the *pyrus communis*, or common WILD PEAR.

But we require not the assistance of botanic knowledge to convince us, that the numerous sorts of fruit, which are cultivated by orchardmen and gardeners, are not NATURAL SPECIES.

Nature propagates and continues ITS OWN SPECIES, *by seed*. But the seeds of a given species,



species, or rather *variety*\*, of apple will not produce apples of the same kind; but a number of different kinds, most of them, probably, resembling the wood crab, rather than the apple which produced them,—let its richness and flavor be what they may†.

The fact seems to be, FRUIT is not, *naturally*, a permanent specific character: even the native wild crab is subject to infinite variety, in colour, shape, and flavor. But, *by art*, the qualities of fruit may be identically preserved.

The

\* VARIETY. This is a term of natural history. It is applied to the individual of a SPECIES, as that of *species* is to the individuals of a GENUS. Thus *apples* and *pears* are *species* of the GENUS, PYRUS. The *golden-pippin* and the *nonpareil*, *varieties* of the SPECIES, APPLE. To speak more generally, SPECIES are (in botany) PERMANENT PRODUCTIONS OF NATURE,—preserved, in perpetuity, by NATURAL PROPAGATION. *Varieties*, on the contrary, are *temporary productions* arising from *accident* or *art*; and, without the assistance of *artificial propagation*, last only one generation; dying with the accidental individuals; their offspring, by SEED, reverting back to the NATURAL SPECIES. This definition is, at least, sufficiently accurate to be applied to the class of plants now under consideration (TREES); tho' not altogether applicable to another class (HERBS).

† By repeatedly sowing the seeds of the seedlings, in common soil, the common crab would, no doubt, be produced.

The business, therefore, of the improvers of fruit is to catch at SUPERIOR ACCIDENTAL VARIETIES, and having raised them by CULTIVATION, to the highest degree of perfection they are capable of, to preserve them in that state by ARTIFICIAL PROPAGATION.

The law of nature, however, though it suffer man to improve the fruits which are given us, appears to have set bounds to his art; and to have numbered the years of *his* creations. Artificial propagation cannot preserve the varieties in perpetuity. A time arrives, when they can be no longer propagated with success. All the old fruits, which raised the fame of the liquors of this country, are now lost; or are so far on the decline, as to be deemed irrecoverable.

The REDSTREAK is given up: the celebrated STIRE APPLE is going off; and the SQUASH PEAR, which has probably furnished this country with more *champaign* than was ever imported into it, can no longer be got to flourish: the stocks canker and are unproductive. In Yorkshire, similar circumstances have taken place: several old fruits, which were productive within my own recollection,  
are

are lost: the stocks cankered, and the trees would no longer come to bear.

The DURATION OF VARIETIES may, however, depend much upon management. For although nature wills that the same wood, or the same set of sap-vessels (for the wood which is produced by grafting is, in reality, no more than a protrusion of the graft,—an extension of the original stock) shall, in time, lose its fecundity; yet, it is probable, that the same art which establishes a variety, may shorten or prolong its duration. Much may depend upon the stock, and much upon the health of the tree, and the age of the wood, from which the GRAFT is taken. Or, perhaps, the CANKER (which seems to be the natural destroyer of varieties) may be checked. But of these in their places.

The popular idea among orchardmen is, that the DECLINE OF THE OLD FRUITS is owing to a want of fresh grafts from abroad—from “Normandy”—under a notion, that the highest-flavored apples grow there, in a state of nature, as the crab in this island!

That the first fruits of our ancestors were fetched from the Continent is highly probable.

But it is equally probable, that the sorts which were originally imported, have long ago been lost; and that the numerous varieties, we are at present possessed of, were raised from the seed, in this country. MILLER, whose extensive practice and connexions enabled him to be an adequate judge of this subject, speaks of them as such. After enumerating some *French* apples, he says—"the sorts, which are above-mentioned, are what have been introduced from France; but there are not above two or three of them, which are much esteemed in England, viz. the French Rennette, the Rennette-grise, and the Violet Apple; the other being early fruit, which do not keep long, and their flesh is generally mealy, so that they do not deserve to be propagated; *as we have many better fruits in England*, which I shall next mention:" and in mentioning the GOLDEN PIPPIN, one of the first apples we know, either for the table or the cider press, he says "the golden pippin is a fruit *peculiar to England*. There are few countries abroad where this succeeds well\*."

The

\* At Ledbury, I was shown a "Normandy" apple:—this tree, with many others of the same sort, having been imported

The STIRE APPLE is generally understood to be a "kernel fruit:" and the HAGLOE CRAB, whose fame as a cider fruit, is little inferior to that of the stire, is still traceable to the parent stock. The original tree is still in being.

It is probable, however, that many of our present fruits have not been produced from our own native crab; but from the apples which were originally imported. Nevertheless, it is more than probable, that some of the higher-flavored, firmer fruits, as the GOLDEN PIPPIN, have been raised, by cultivation, from the native species. The process is simple and easy: and a young man of ingenuity and enterprize, and in a proper situation, might be less rationally employed, than in improving this species of his country's produce.

Select, among the native species, individuals of the highest flavor. Sow the seeds in a highly enriched seedbed, in the manner which will be described. Select, from among the seedlings, the plants whose wood and leaves wear the

imported immediately from France. On seeing and tasting the fruit, I found it to be no other than the *bitter-sweet*, which I have seen growing, as a neglected wilding, in an English hedge.

the most *apple-like* appearance. Transplant these, into a rich deep soil, in a genial situation, and at distances which will be mentioned; letting them remain in this nursery until they begin to bear.

With the seeds of the fairest, richest, and best-flavored fruit, repeat this process. And, at the same time, or in due season, engraft the wood which produced this fruit, on that of the richest, sweetest, best-flavored apple: repeating this operation; and transferring the subject, under improvement, from one tree and sort to another, as richness, flavor, or firmness may require. Continuing this double mode of improvement, until the desired fruit be obtained.

There has, no doubt, been a period, when the improvement of the apple and the pear was attended to in this country. And should not the same spirit of improvement revive, it is probable, that the country will, in a course of years, be left destitute of valuable kinds of these two species of fruit: which, though they may in some degree be deemed objects of luxury, long custom seems to have ranked among the necessaries of life.

Having

Having thus endeavoured to convey a general idea of the nature and propagation of varieties,—it will be proper to enumerate some of the most celebrated of those which are now in cultivation, in these counties:—to describe, or even enumerate, *all* the present varieties of orchard fruit would be impossible. They are without number. In Herefordshire, more particularly, a very considerable proportion of the fruit which is grown is “kernel fruit;” is produced from trees that have been raised from the seed; and which have never been grafted. Consequently each tree is a separate variety; bearing the name, perhaps, of its planter, or of the “ground” it grows in.

There are, nevertheless, numbers which are universally known; and some of them sufficiently celebrated to be entitled to notice.

Of APPLES,—the STIRE stands first in estimation. The *fruit* of this variety is somewhat below the middle size. The form rather flat. The colour a pale yellowish white, with sometimes a faint blush on one side. The flesh tolerably firm. The flavor, when fully ripe, fine. It is deemed, by most people, a tolerably

rably good eating apple \*. The *cider*, which is produced from it, in a soil that is adapted to it, is rich, highly flavored, and of a good body:—its price frequently fourfold that of common sale cider. The thin *limestone soils* on the margin of the Forest of Dean, are said to produce the richest fire cider.—The *tree* which bears this apple is of a singular growth:—remarkably “beefom-headed”:—throwing out numerous, straight, luxuriant, upward shoots, from the crown; taking the form of a willow pollard; running much to wood; and, in deep soils, growing to a great size before it become fruitful.

The HAGLOE CRAB is, at present, next in esteem. It has already been mentioned, that this variety is traceable to the original seedling. It was produced, about seventy years ago, in a nursery among other stocks raised from the seed, by Mr. BELLAMY of HAGLOE in Gloucestershire, grandfather of the present Mr. BELLAMY,

\* There is an apple called the *red fire*; but it has no peculiar affinity with the true fire. In Herefordshire, about Marcle, I met with a “yellow fire”—and on the Forest there is the “kernel fire”:—both of them probably kernel fruits, which, bearing some likeness of the true fire, have had its name improperly given them.



BELLAMY, near Ross in Herefordshire; who draws from it (that is from trees grafted with scions from this parent stock) a liquor, which, for richness, flavor, and *price on the spot*, exceeds, perhaps, every other fruit liquor, which nature and art have produced. He has been offered sixty guineas for a hoghead (about 110 gallons) of this liquor. He has likewise been offered bottle for bottle of wine or spirituous liquors, the best to be produced; and this without freight, duty, or even a mile of carriage to enhance its original price.

This fruit, while growing, is nearly white; when fully ripe it has a yellowish cast; sometimes freckled with red on one side, like the common white crab. The size about that of the stire apple; but the form more oblong. The flesh remarkably soft and woolly, but not dry; being furnished with a sheer, but, when fully ripe, sweet juice; which, however, is much smaller in proportion to the quantity of fibrous matter, than that of most other apples. The flavor, when ripe, resembles that of the cashew apple of the West-Indies; and, what is remarkable, the texture of the flesh is not unsimilar to the pulp of that fruit. The  
cider

*cider*, notwithstanding the sheerness of the juice, is, when properly manufactured, singularly rich; and, notwithstanding the faint smell of the apple, is highly flavored: and, what is equally remarkable, the liquor is of the highest colour, notwithstanding the paleness of the fruit.

The GOLDEN PIPPIN is in high estimation as a cider apple; and may rank as the third of this district. It is more generally known than the Hagloe crab, and, at public market, its liquor, I believe, is generally next in price to that of the fire apple.

The old REDSTREAK is yet in being. A few old trees are still remaining. The *fruit* small, roundish, of a pale yellow ground, with numerous faint-red streaks. The flesh firm, full of juice, and, when ripe, finely flavored; a palatable eating apple. The *cider*, at present, is not, I believe, in particular estimation: little, if any genuine redstreak cider is now made. It never was, I believe, equal to that of either of the preceding apples. The *tree* of this apple is of a singularly awkward growth. Crooked—reclining—ragged and unsightly.

The

The **WOODCOCK** is another favorite old cider fruit. But is now going off: many old trees, however, are still left in the district. The *fruit* is much larger than any of the preceding sorts: above the middle size. The form somewhat oblong; with a long stalk, set on in a peculiar manner; feigned to resemble the woodcock's beak (hence the name). The colour that of the redstreak, with the addition of some dark blood-red streaks on one side. The flesh remarkably fine; equally fit for culinary purposes and for cider. The *tree* large, and strongly featured; forming large boughs in the pear-tree manner.

Other favorite cider apples, at present, are

The **MUST**:—an old favorite fruit, of which three sorts are enumerated.

The **PAUSON**:—a middle-sized, green apple.

The **ROYAL WILDING**:—a large white apple.

The **DYMMOCK RED**: middle-sized,—red.

The **COCCAGEE**: above the middle size; greenish white, with an orange blush:—well fleshed, and highly flavored.

**RUSSETS**, of various kinds, are in good esteem: particularly the **LONGNEY RUSSET**.

**BROMLEY,**

BROMLEY, FOXWHELP, RED CRAB, QUEENING,—all of them large red apples,—are in good estimation for cider.

Of PEARS, the SQUASH is in much the highest esteem. It is an early fruit; remarkable for the tenderness of its flesh. If it drop ripe from the tree, it bursts to pieces with the fall: (hence most probably its name). The liquor made from this fruit is pale, sweet, yet remarkably *clean*, and of a strong body: a most elegant liquor; if duly manufactured, from a soil which suits it. *Taynton*, on the Gloucestershire side of Mayhill, has long been famous for the superior excellency of its “squash-pear perry”. In price, it bears a similar proportion to common perry, as the fire cider does to the ordinary kinds.

The OLDFIELD is a favorite old pear; remarkable for the elegant flavor of its liquor.

The BARLAND pear is in great repute, as producing a perry, which is esteemed singularly beneficial in nephritic complaints; as

The RED PEAR is for affording a liquor of singular strength. \*

The

\* Frequently, it is said, strong enough to “flash in the fire”

The HUFFCAP, and the SACK, are other pears which have been usually grafted: and besides these and a variety of others, great numbers of "kernel fruits" are found among the pear trees, as well as among the apple trees, of this district.

THE PRODUCTION OF ORCHARD FRUITS, for the purpose of LIQUOR, now requires to be examined in detail; agreeably to the subdivisions of the subject enumerated at the head of this article. But in giving this general view of the proper management of orchards, the practice of this division of the cider country (so far at least as it has come to my knowledge) will be found, in many particulars, improper to be held up as a pattern. The method of procedure, in this case, must therefore be, to select the best instances of the practice of these districts, and make up the deficiency from my own practical knowledge of the subject of planting: in order to endeavour to render this article, what I wish it to be, *general* and *practical*.

I. THE SITUATION OF ORCHARDS.  
Through the kingdom in general, we see apple trees in no other situation, than in small  
VOL. II. S inclosures

inclosures or yards, adjoining to a house or garden; having been planted, perhaps, without much regard either to SOIL or ASPECT: LOCALITY, alone, having determined the site.

But in this district, LOCALITY, with respect to the HOMESTALL, appears to have had little weight in determining the situations of orchards; which we frequently see scattered about in every part of a township; perhaps half a mile from any habitation.

In situations where orchard fruits are scarce; and where a considerable market for them is within reach; such orchards might be hazardous. But in this country, *fruit* is of little value, until it be converted into *liquor*: a change which thieves,—petty thieves, at least,—have not an opportunity of effecting with sufficient secrecy. Cottagers have no mills. The stolen fruit must be carried to a neighbour's mill to be ground. The neighbour knows each man's fruit; and the quantity he grows: and the robbery is of course detected. In small quantities, especially near towns, orchard fruits are no doubt stolen. But the theft is similar to that of stealing a mess of turneps in Norfolk:  
they

they are never missed ; and the real loss is inconsiderable ; except in some particular situations.

ASPECT is of much more importance, here, than locality, and appears to have had due weight in fixing the sites of orchards, in this district ; for though orchards are found on every side of hills, the south east, with a screen to the north, seems to be the favorite aspect. The “ morning sun ” is esteemed genial to fruit : an old idea ; and not merely a popular notion ; though in some degree it may be deemed such.

It is not probable that the *quality* of the morning rays is much superior to those of the noon-day or evening sun (the popular idea) ; but it appears demonstrably, that a south-eastern aspect collects a greater *quantity* of heat ; enjoys a longer day ; than any other aspect. It is noon before a western aspect *reflects* a ray. In the morning, it will frequently remain dewy and cold, several hours after vegetation has been roused, against an eastern inclination. The afternoon sun is, no doubt, more intense, on the west than on the east side of a hill ; but its duration is short. In an

S 2                      afternoon,

afternoon, the air is everywhere warm; and a regular supply of warmth appears to be more genial to vegetation, than a great and sudden transition from heat to cold. The coolness of the evening comes on, and vegetation is probably checked as soon, or nearly as soon, in all aspects. Hence we may, I think, fairly conclude, that the southeasterly aspect enjoys more vegetative hours, and receives a more regular supply of heat, than any other aspect.

Nevertheless, on a fruit-liquor farm, it may be prudent to have "plantations" in different aspects. Blights (whatever they are) appear to be communicated to the trees by the wind. In 1783, orchard-fruit was cut off in every situation, except a northwest aspect; in which I saw several orchards fully fruited.

A northern aspect, however, has its disadvantage; and although it may, in this country, especially where the soil is warm, produce fruits fit for the purpose of liquor; yet, in the more northern provinces, it may be altogether inadequate to that purpose. A hill dipping to the south partakes of the nature of a south wall. The atmosphere, a few feet from the ground, is probably many degrees hotter on  
the



the south than on the north side of a regular hill: and the richness and flavor of fruit depends much on the heat of the atmosphere it matures in. The fruit of the branch of a vine, for instance, which is introduced into a stove or greenhouse, is much richer and higher-flavored, than that of other branches of the same vine, which remain in the common atmosphere. Hence every means should be used to render the atmosphere of an orchard as warm as may be—to collect as much heat within its area as possible. Therefore, while it enjoys the morning sun, it ought to have a tall woody skreen to the east, to break off the peircing winds from that quarter. The winds travel horizontally, or nearly so; while the sun soon gains a sufficient elevation, to lodge its rays in the atmosphere of a skreened orchard.

Much has been said about FRUIT TREES IN HEDGES, in the cider counties. But this should seem to be one of those *wild ideas*, which hasty travellers are liable to catch. Crab trees, perhaps, are more common in the hedges of this, than they are in those of other districts; and hedge crabs, here, as in other places, are sometimes grafted with apples; but I have

met with very few instances, in which hedgerows have been designedly, and regularly, filled with apple trees. About Bromyard, I saw one or two instances, in which apple trees form close woody hedgerows; blowing out, on either side, over the adjoining inclosures. But the practice of planting fruit trees in hedges, I apprehend, has never been common, and is now, I believe, wholly laid aside. There are two disadvantages attend it:—the hedge is inevitably destroyed, and the fruit is difficult to collect.

II. THE SOIL OF ORCHARDS. It appears to be sufficiently well ascertained, in this district, that the same species of fruit, when produced on different soils, affords liquors of very different qualities. The *fire apple*, on the LIMESTONE LANDS of the Forest of Dean, yields a cider, which is marked by richness, (sweetness), and fulness of flavor: while the same apple, in the vale of Gloucester, a strong deep rich soil, affords a liquor, whose predominant qualities, without great diligence in the manufacture of it, are roughness and strength.—The *Hagloe crab*, too, seems to require a CALCAREOUS ROCK to give full richness and

and flavor to its liquor. The orchard, which yields the nectarious juice, that has been spoken of, has for its soil a very shallow loam, lying on a soft sandy rock—provincially a “dunstone”—which, on examination, proves to be pretty strongly calcarious; and is of a contexture sufficiently porous and loose to admit the fibrils of vegetables.

On the contrary, the *squash pear* draws the finest liquor from DEEP STRONG LAND. A plug of soil, taken beneath a pear tree, in a celebrated orchard, in the township of Taynton, is a STRONG BROWN CLAY, without a particle of calcarious earth in its composition. Nor does the subsoil, a still stronger RED CLAY, shew the least marks of calcariosity\*.

This contrariety may be reconcileable in the specific qualities of these fruits. The juice of  
the

\* I have observed a PEAR-TREE flourish on the side of a COLD BLUE-CLAY SWELL (Lassington hill) where the soil is so infertile that scarcely any herbage, except the wood fescue, will grow upon it; and where the native crab evidently starves for want of nourishment. There are many similar swells scattered over this district; and it is probable, that their value, (at present very inconsiderable) might be advanced manyfold, by planting them with some of the superior sorts of pear trees.

the pear is naturally saccharine; while that of the apple abounds with acidity; and, if we may venture to reason on a subject so little understood as is that of the vegetable economy, what is more likely to lessen the proportion of acidity, than the tree which produces it feeding among calcarious earth; its natural destroyer?

From the whole of the evidence collected in this district, I am inclined to believe, that there are many situations, even in the more northern provinces—notwithstanding the disadvantage of climature—in which, with due attention to aspect, a judicious choice of fruit, and proper management of the liquor—even CIDER of the first quality might be made.—PERRY of a good quality, I am persuaded, might be made in almost any quarter of the kingdom.

III. RAISING STOCKS. To convey an adequate idea of the BUSINESS OF THE NURSERY, it will be proper to divide it into

The choice of the seed.

The seedbed.

Transplanting.

Training.

I. The

1. The SEEDS generally used, in this intention, are the kernels of cider apples, separated from the "must" or residuum of the press. These are either sown in autumn, or are kept dry in sand, or otherwise, until spring; care being had, in either case, to preserve them from mice, during winter.

When the production of fresh varieties is the principal object, or when fruits, which are yet too austere, require to be further improved by cultivation, seeds thus obtained may be eligible. But for fruits, whose flavor is already raised to the desired pitch, and more especially for those, which have passed the point of perfection, as some of the dry spungy varieties appear to have done, the seeds should certainly be those of the natural species,—the native crab,—which most districts produce, and whose juice will generally repay the trouble of collecting.

2. THE SEED BED should be adapted to the intention.—If new varieties, or the improvement of old ones, be the object, the seed bed ought to be made as rich as possible: perhaps even a frame, or the stove, might be found eligible. On the contrary, if the preservation  
of

of varieties be all that is wanted, an ordinary loamy soil is sufficient. In either case, it is proper that it should be perfectly clean, from root weeds at least, and that it should be double dug, from a foot to eighteen inches deep. The surface levelled and raked fine, the seeds ought to be scattered on, about an inch asunder, and covered, about half an inch deep, with some of the finest of the mould, previously raked off the bed, for that purpose. During summer, the young plants should be kept perfectly free from weeds, and the ensuing winter may be taken up for transplantation; or, if not crowded in the seed bed, may remain in it, until the second winter.

3. TRANSPLANTING. The nursery ground, like the seed bed, should be enriched agreeably to the general intention; and ought, in common good management, to be *double dug*, at least fourteen inches deep; eighteen or twenty inches deep is always preferable.

The seedling plants ought to be *sorted*, agreeably to the strength of their roots, that they may rise evenly together. The top or downward roots should be taken off, and, in  
*this*

*this* operation, the longer side rootlets should be shortened.

They should be planted in rows, three feet apart, and from fifteen to eighteen inches asunder in the rows; care being had not to cramp the roots, but to bed them evenly and horizontally among the mould.

If the plants be intended merely for stocks to be grafted, they may remain, as they generally do, in this and other districts, in this situation, until they be large enough to be finally planted out. But, in strictness of management, they ought, two years previous to their being transferred to the orchard, to be RETRANSPLANTED;—into fresh, but unmanured, double-dug ground, aquincunx; four feet apart every way; in order that the *feeding fibres* may be brought so near the stem (yet have sufficient room to form in) that they may be removed with it, into the orchard: instead of being, as they generally are, left behind in the nursery. Hence, in this second transplantation, as in the first, the branches of the root should not be left too long; but ought to be shortened, in such a manner, as to induce them to form a regular, GLOBULAR ROOT: sufficiently

ciently small to be removed with the plant ;— yet sufficiently large to give it firmness and vigour in the plantation.

If the raising or improvement of varieties be the object in view, the nursery ground should be naturally deep and well soiled, and highly manured ; and the plants repeatedly moved—as every second, third, or fourth year—that they may luxuriate, not only in rich, but in fresh pasturage ; thereby doing, perhaps, all that art can do, in this stage of improvement, towards giving freedom to the sap vessels, and size and richness to the fruit.

4. TRAINING. The *intervals* may, while the plants are small, be cropped with such kitchen garden produce, as will not crowd or overshadow the plants ; the *rows* being kept perfectly free from weeds,

In *pruning* the plants, the leader should be particularly attended to. If it shoot double, the weaker of the contending branches should be taken off.—If the leader be lost, and not easily recoverable, the plant should be cut down to within a hand's breadth of the soil, and a fresh stem trained. Next to the leader, the stem boughs require attention. The undermost



dermost boughs should be taken off by degrees; going over the plants every winter;—always cautiously preserving sufficient heads to draw up the sap; thereby giving strength to the stems, and vigour to the roots and branches: not trimming them up to naked twigs, as in the common practice; thereby drawing them up prematurely tall, and feeble in the lower part of the stems.

The *length of stem*, to which stocks are usually trained, in this district, is six feet;—sometimes to near seven feet;—a height which is much preferable: half a rod high would be still more eligible. A tall-stemmed tree is out of the reach of stock, and is much less injurious to whatever grows under it, than a low-headed tree; which, while it is the cause of mischief, is itself in harm's way.

The *thickness of the stem* ought to be in proportion to its height: a tall stock, therefore, requires to remain longer in the nursery than a low one. The usual size, at which stocks of the ordinary height are here planted out, is four to six inches girt at three feet high.—A size which they will reach, with proper management, in seven or eight years. The price  
of

of such stocks, in this district, at present, (un-grafted) is eighteen pence each! \*

IV. PLANTING ORCHARDS. In conducting this business, properly, various considerations are requisite, as

1. The distance.
2. The disposition.
3. The time of planting.
4. Taking up the plants.
5. Pruning the plants.
6. Putting them in.
7. Defending them.
8. Aftermanagement of the stocks;

1. DISTANCE. This depends upon the site, and the general intention. If a mere ORCHARD be the object; namely, a plantation of fruit trees placed in as close order as the nature of fruit trees will admit; the distance may be much shorter, than in a FRUIT GROUND; which, notwithstanding the plantation, is intended to remain an object of husbandry.

In this district, we see fruit trees standing at all distances. In close ORCHARDS, ten yards

\* I met with one instance of crabstocks being gathered in the woods; and with a good prospect of success.

yards seems to be a prevailing distance. But the proper distance in this case depends on the natural growth of the given trees: from ten to twelve yards (half a chain) may, in this intention, be an eligible distance\*.

In the GRASS GROUNDS of Gloucestershire, and the ARABLE FIELDS of Herefordshire, twenty yards is a common distance: some I have observed with intervals of twenty five yards. A chain's length (twenty two yards) may be taken as a good medium distance.

In *this* case each acre sustains ten trees; in *that* forty.

2. DISPOSITION. In GROUNDS, the trees should be planted in *cross lines*, for the convenience of plowing. In ORCHARDS, they ought to be set in the *quincunx* manner, that they may have equal room to spread on every side.

3. The TIME OF PLANTING fruit trees is October, and November;—or February, March, or April; according to the season and the

\* In old orchards I have found them at only eight yards, in one instance only six yards distance; but the trees have not head room to acquire nearly their full growth.

the foil. Where the foil is dry and light, autumn is preferable; as, during winter, the foil has time, assisted by the winter's rains, to settle firmly to the roots. On the contrary, in a cold, wet situation, where the foil is tenacious, and the substratum retentive of moisture, the spring months are a more eligible season of planting.

4. In TAKING UP THE PLANTS, more attention is requisite, than is usually paid to this operation. Their future progress rests principally upon it. The roots ought to be as numerous, and as long as possible. For the purpose of affording immediate sustenance to the plant, and of giving it firmness and stability in the foil. Hence the impropriety of crowding the plants in the nursery: and hence the utility of transplanting them previous to the final planting.

5. PRUNING THE PLANTS. The roots ought not, in *this* case, to be touched (except taking off the downward roots in the center) but the top should, at this time, receive the form, which it afterward ought to take. The leader should be shortened, and the smaller side boughs be taken off; leaving a proper choice

choice of the larger side boughs *entire* and *untouched*\*; to draw up the sap; and, in due time, to furnish proper wood for grafting.— Hence these boughs should have a proper elevation; and should stand in different directions; that the tree, after it be grafted, may take a regular head. This pruning of the head lessens the power of the wind, and, at the same time, by assisting the roots, ensures, with common care, the success of the plant.

6. The METHOD OF PLANTING. This requires particular notice. 'The ordinary method' in the Gloucestershire cow-grounds, is to dig a hole, wide enough to take the roots (if not very long); which being placed within it, the mould is returned upon them in the order in which it came out; carefully replacing the sods on the surface, that no grazing ground may be lost! A mode of planting, which is too common throughout the kingdom.

A method, which is more likely to succeed is this: the ground being set out with stakes,  
driven

\* Except when the root, for want of due transplantation, is weak. In this case, the top ought to be reduced in proportion.

driven in the centers of the intended holes, describe a circle, five or six feet in diameter, round each stake. If the ground be in a state of grass, remove the sward, in shallow spits; placing the sods on one side of the hole. The best of the loose mould place, by itself, on another side; and the dead earth, from the bottom of the hole, in a third heap.

The depth of the holes should be regulated by the nature of the subsoil. Where this is cold and retentive, the holes should not be made much deeper than the cultivated soil.—To go lower is to form a receptacle for water, which, by standing among the roots, is very injurious to the plants. On the contrary, in a dry light soil, the holes should be made considerably deeper; as well to obtain a degree of coolness and moisture, as to be able to establish the plants firmly in the soil. In soils of a middle quality, the hole should be of such a depth, that, when the sods are thrown to the bottom of it, the plant will stand at the same depth in the orchard, as it did in the nursery. Each hole, therefore, should be of a depth adapted to the particular root, which is to be planted in it. The holes, however, ought,  
for

for various reasons, to be made previous to the day of planting. If the season of planting be spring, and the ground and the weather be dry, the HOLES should be WATERED; the evening before the day of planting, by throwing two or three pailfuls of water into each : a *new*, but an eligible practice.

In planting, the fods should be thrown to the bottom of the hole; chopt with the spade; and covered with some of the finest of the mould. If the hole be so deep that, with this advantage, the bottom will not be raised high enough for the given plant; some of the worst of the mould should be returned; before the fods be thrown down.

The bottom of the hole being raised to a proper height; and adjusted; the lowest tire of roots are to be spread upon it: drawing them out horizontally; and spreading them, in different directions, as the bird spreads its foot when it stands on a level surface: drawing out the rootlets and the fibres, which severally belong to them; spreading them out as a feather, or as the frond of the fern;—pressing them evenly into the soil; and covering them, *by hand*, with some of the finest of the mould:

one person steadying the plant; another adjusting and bedding the roots; and a third supplying the mould: which being raised high enough to receive another root, or another tire of roots, they are to be spread out horizontally upon it, and bedded in a similar manner: thus continuing, until every root be bedded, separately, horizontally (or somewhat declining) freely, yet firmly, among the best of the soil: great care being had to work the mould well in, *by band*, among the roots beneath the crown, that no hollownes, nor false filling, may be left: to prevent which, the mould, after the roots are all bedded, and covered some depth, should be pressed, or trodden hard (according to the nature of the soil and the state of the season) with the foot: the remainder of the mould being raised into a hillock round the stem; for the triple use of affording coolness, moisture, and stability to the plant.

In forming these hillocks some little skill is requisite. The soil ought not to press against the stem much higher, in the orchard, than it did in the nursery: yet it is proper that there should be a descent for rain water,  
*from*



*from* the stem; not *toward* it. To this end a dimple or little dish should be made on the top of the hillock; and, from the rim of this, the slope should be gentle to the circumference of the hole; where the broken ground should sink some few inches below the level of the orchard.

Much of this will, no doubt, be deemed tedious and unnecessary: by those, I mean, who have been accustomed to *bury* the roots of plants, in the gravedigger's manner: but I can recommend every part of it, to those who wish to ensure success, from my own practice; in which this method of bedding the roots arose; and in which only, I believe, it has been used.

7. DEFENDING THE STOCKS. Plants which have been properly transplanted, in the manner recommended foregoing; whose heads have been judiciously lessened; and which have been planted in the manner here described; seldom require any other stay than their own roots. If, however, the stems be tall, and the roots few and short, they should be *supported*, in the usual manner with

T 3                      stakes

stakes, or in a manner which will presently be mentioned.

The methods of *guarding* young trees from *live stock*, in this district, are various: the cheapest, and, perhaps, the most common way is that of sticking some tall thorns round the plant, at a distance from the root; binding the tops of the thorns with a with, and the middle of them with another; forming them into a sort of cone round the plant.—This, however, is only a slender guard; and the thorns are liable to chafe the stem of the plant. I have seen many plants materially injured by this method of defending them.

Opposed to this, the most expensive guard—not unfrequently made use of in the cow-grounds of Gloucestershire—are four posts, put down, in a square, about the plant; with five or six short rails on either side. The expence of this, if done in a strong workmanlike manner, is too great for common practice.

The next is three posts, set in a triangle, with rails in a similar manner.

In Herefordshire, and on the Herefordshire side of Gloucestershire, where young orchards are kept under the plow, two posts, only, are  
in

in use; namely one large post, slit with a saw, and placed flatway, with the faces to the plant; and about two feet apart; with rails on each side, nailed upon the edges of the posts. This is beautifully simple, strong, a sufficient guard, if carried high enough, and out of the way of the plow; which has, in this case, nearly the same possession of the ground, as if no trees were planted.

In this case, however, the upper rails should be compassing (bowing outward) equally to protect the tops from cattle, and to prevent the stems from being chafed against them. If these posts were put down at the time of planting, setting them within the planting holes, the roots would not be afterwards disturbed; and, by means of hay-ropes, the plants might be steadied between the lower rails, without the trouble, or the danger of staking.

In this and every other case, unless the lower rails be placed very near to each other, the bottom of the stem should be guarded against sheep; which in winter, especially while snow is upon the ground, will peel off the bark of the young trees; and, in a few hours, destroy the whole plantation.

T 4

8. The

8. THE AFTERMANAGEMENT of the STOCKS consists in *watering* them (if requisite) the first summer: not, however, in the ordinary manner, by pouring small quantities, from time to time, against their stems; but by throwing as much at once as the hole will imbibe, into the trench left within the outer ring, round the skirts of the hillocks: thus communicating coolness, and a *lasting moisture*, rather than a *temporary wetness*, to the immediate region of the feeding fibers. And, secondly, in *cultivating the hillocks*, so far as to keep the surface over the roots free from grass and weeds, and the skirts of the hillocks in a loose pulverous state, to induce the roots to spread horizontally on every side.

In a plantation, whose soil is kept in tillage, less care is requisite than in a grass-ground plantation; in which the circles of broken surface, round the plants, should be kept hoed as a garden; and the covering of soil be from time to time carefully worked over with the spade. As the roots extend, *the circles should be enlarged*, by fresh rings of sward being cut off and inverted; in order to encourage, by air and pasturage, their farther extension.

#### V. GRAFTING

V. GRAFTING. By old orchards, it appears that *whip-grafting* near the ground (letting the young plants remain in the nursery until fit to be planted out,) has formerly been the prevailing practice. But, in this case, the planter must take the nurseryman's word as to the sorts; whereas he wishes to be on a certainty. He likes to see the grafts taken from a tree, whose fruit he *knows* \*. Besides it is thought that whip-grafting, upon free stocks, has injured some of the more valuable varieties of fruit. Be this as it may, the practice, at present, is in disrepute.

The practice, which has lately prevailed, and which is still prevalent, is this: the stocks, having stood some two three or four years in the plantation, until they have established themselves firmly in the soil, and have acquired a fulness of growth, are *cleft-grafted*, in the following extraordinary manner,

*The entire head of the stock is cut off!*—horizontally, with a saw, about six feet high:—  
higher

\* It is not enough to know the sort of fruit:—the state of the tree, from which the grafts are taken, ought likewise to be known. It is proper to see that it be in *full health*; and of a *middle age*.

higher if the stock will admit of it, and the sort to be grafted be inclined to form hanging boughs: while an upright close headed sort may, it is thought, be grafted upon a still lower stock. The top of the stump, being cleft, the grafts are inserted, in the usual manner; by men who go about the country, in the grafting season, for this purpose.

The method of *defending* the *grafts* put in, in this manner, is perhaps peculiar to this district. They are inclosed within a kind of openwork wicker basket, made somewhat in the manner of the bottle-makers baskets (prickles) with split osier twigs, about the size of the finger. When they are put upon the stock, they resemble the top of a tunnel; about two feet high, and about one foot diameter at the top: they are, however, worked flat; somewhat in the form of the mount of a lady's fan; much broader at the top than at the bottom. The compost used in grafting having remained a few days to stiffen, the bottom part of the guard is wrapt tight round the stem, immediately below the loam, upon which it is bound with rope yarn; fixing it  
in

in such a manner that the upper edge forms the largest circle its length will allow.

These wicker guards—provincially called “BRAIDS”—are most ingeniously adapted to this mode of grafting: they not only guard against cattle, but prevent rooks and other birds from disturbing the grafts, before they be established in the stock; and, what is of singular advantage to some sorts of apple trees, they set up a dropping head—giving the shoots (which afterward become boughs) an upward tendency.

But this method of grafting has its disadvantage: in a fine young orchard, which has been grafted in this manner, in the vale of Gloucester, I observed, that several of the trees are faulty in the crowns of the stems, which are now eight or nine inches diameter. The defect is owing to one of the grafts having miscarried; by which means a lodgement being made for water, a decay of that side of the stump of the stock has taken place; creating a fore, which the surviving graft has not been able to heal; there being now holes nearly large enough to admit the hand, almost to the center

center of the stem: a premature decay of the tree must be the inevitable consequence.

In Herefordshire, I saw another orchard, (which has been planted in the same manner, and which has got about the same growth), in which the trees *cleave in the crowns*; both grafts having in this case succeeded. The wind having split some of them, and others being in danger of sharing the same fate, the judicious occupier of this orchard has secured them with iron bolts; put through the crowns; having a broad head at one end, and a long iron pin or key at the other. The heads are already over grown, and some of the keys nearly buried\*.

By letting the stocks remain until they be large enough *to be grafted in the boughs*; namely until the trained boughs be about an inch in diameter; those evils are avoided: the grafting becomes more certain; there being more chances of success; and the trees, by forming their ramifications in the natural way, are much less liable to be torn to pieces by the winds. Some time, it is true, may seem to be

\* This, I have since learnt, is not an unusual expedient



be lost; the trees certainly will not come so soon to *bear*; but it is highly probable, that they will begin to bear a *burden* of fruit sooner, and will, it is much more than probable, continue to bear longer, than trees *grafted in the stock*.

# VI. The AFTERMANAGEMENT OF ORCHARDS. This divides into

The management of the ground,

The management of the trees.

1. The GROUND. It has been already mentioned, that, in Herefordshire, the soil of orchards is generally kept under tillage;—in Gloucestershire, in *grafs*. Not, however, I apprehend, so much in pursuance of different principles in the managing of orchards; as from the circumstances of Herefordshire being an *arable*, Gloucestershire 'a *grasland* country.

Either practice has its disadvantage. Fruit trees, when fully grown, especially if they are of a spreading growth, and are suffered to form drooping branches,—are very injurious to *arable* crops: their roots, their drip, and their shadows are destructive, not to corn only,  
but

but to clover and to turneps\*: besides being, under these circumstances, still farther injurious, by preventing a free circulation of air; and in being in the way of the plow teams; which, when the trees are loaded with leaves and fruit, can frequently with difficulty *creep* under them!

It is observable, however, that *tillage* is favorable to the trees; especially to the growth of young trees. While in *grass* grounds (under ordinary management) their progress is comparatively slow; for want of the earth's being stirred about their roots; and by being injured by the grazing stock; especially low-headed, drooping trees.

After the trees begin to bear, stock are equally inconvenient; in a fruit ground. Cattle not only destroy all the fruit within their reach; but the fruit is dangerous to the cattle; by being liable to lodge in their throats, in the manner of small turneps. In the fruit season, especially in windy weather, the

\* I have observed, in a fruit ground, in which a remarkably fine crop of young clover was rising, that, under the *strip* of the trees, there was not a plant! A piece of turneps I have seen *dotted* in nearly the same manner.

the cows are frequently obliged to be kept out of their grounds, at a time, perhaps, when the grafs is wanted. Prudent men, however, endeavour to provide against this inconvenience, by eating the fruit grounds bare, before the gathering season: and every prudent man ought to keep the boughs out of their reach; that no injury may be sustained, previous to that season; as well as to give air and sunbeams to his grafs.

From these circumstances we may conclude, that, in situations, in which fruit grounds can with propriety and convénieney be kept either in tillage or in grafs, they ought, while the trees are young, to be kept under the plow; and that, when the trees become particularly injurious to the arable crops, the ground ought to be converted to a state of grafs.

In the deep-soiled district about Dymmock and Marcle, where the whole country may be said to be a forest of fruit trees,—the occupiers of fruit grounds, experiencing the evil of trees, in arable lands, are planting in their grafs grounds. This, however, appears to be a wrong principle. Let them lay their old  
orchards

orchards to grafs: and, if they plant, break up their young orchards to arable; this will be changing the course of husbandry, and be at once beneficial to the land and the trees.

In the Bromyard quarter of Herefordshire, where considerable quantities of hops are raised, it is common to plant young fruit trees in the hop grounds. The trees, while young, do little injury to the hops; while the manuring and cultivation of the hop grounds is highly beneficial to the young trees. Before they acquire an injurious size, the grounds are worn out for hops, and returned to the common course of husbandry.

2. THE MANAGEMENT OF THE TREES. If we view the common practice of the district throughout, we may safely conclude, that, after the trees are out of danger of being thrown down by cattle, no attention whatever is paid to them, other than that of collecting the fruit, when they happen to "hit."

Water boughs are seen dangling, as bell ropes, perhaps to the ground: while the upper part of their heads are loaded with wood; as impervious to the sun and air as the heads of pollard oaks, or neglected gooseberry bushes;  
with,

with, perhaps, an additional burden of misletoe and moss to bear.

Indolence and false economy are, no doubt, the *principles*, on which this slovenly conduct is pursued. The improvident occupiers of those neglected orchards, unmindful of the damage they annually sustain by the encumbrance of the trees, refuse to bestow a little leisure time, or lay out a few shillings, to render them productive !

This shameful management, however, is not universal. There are orchards, in every quarter of the district, which appear to have some little attention paid them ; and some few, which are in a degree of keeping, equal to the Kentish orchards.

By taking a view of the NATURAL ENEMIES of fruit trees, we shall be the better able to judge of the art requisite to their preservation.

The enemies of the fruit trees under notice are

A redundancy of wood  
The misletoe  
Moss  
Spring frosts  
Blights

VOL. II.

U

Insects

Insects

An excess of fruit

Old age.

Some of them are beyond human reach ; but most of them are within the controul of art.

A REDUNDANCY OF WOOD is the cause of numerous evils. The roots, or rather the pasturage, which supports them, is exhausted unprofitably ; the bearing wood robbed of part of its sustenance ; and the natural life of the tree unnecessarily shortened : while the superfluous wood, which is the cause of this mischief, places the tree in perpetual danger, by giving the winds additional power over it ; and is injurious to the bearing wood, by retaining the damps, and preventing a due circulation of air.

The underhanging boughs weigh down, especially when loaded with leaves, the fruit-bearing branches they are preying upon ; giving them a drooping habit ; or at least preventing their taking, as they ought and otherwise would, an ascending direction ; while those, which grow within the head, are equally injurious

jurious in crossing and chafing the profitable branches.

The outer surface, only, is able to mature fruit properly. Every inward and every underling branch ought therefore to be removed: and, in some cases, part of those, which reach the surface, might, with propriety, be taken out; to give due health and vigour to those which were left. It is no uncommon sight to see trees, in this district, with two or three tires of boughs pressing down hard one upon another; with their twigs so intimately interwoven, that, even when the leaves are off, a smallbird can scarcely creep in among them. Trees, thus neglected, acquire, through a want of due ventilation and *exercise*, a runty, stunted habit; and the fruit they bear becomes of a crude inferior quality.

The great object of the fruit farmer is to produce a CROP EVERY YEAR: and nothing is more likely to obtain it than keeping his trees in perfect health, and endeavouring to prevent their bearing beyond their strength, in a general fruit year.

The MISLETOE is, in this country, a fatal enemy to the apple tree. The native crab

tree is frequently killed by it; and apple-trees too often injured; and this, notwithstanding it is easily overcome, and is applicable to a profitable purpose; sheep affecting it as they do ivy: yet such is the power of indolence, and such the plentifulness of hay in this country, that a considerable portion of the produce, of many orchards, is cut off by this singular plant.

The ordinary method of clearing trees from it is to pull it out with hooks, in frosty weather, when being brittle, it readily breaks off from the branches.

Moss is chiefly, perhaps, owing to the nature of the soil, and cannot be altogether prevented; but it may in most cases be checked, and its evil effect in a great measure avoided. In Kent, there are men who make a business of cleaning orchard trees; being paid so much a tree, or so much for the orchard, according to the state of foulness.

In Herefordshire, I saw several orchards, in which the trees were almost entirely subdued by this vegetable vermin. Some of the trees, perhaps, with only one bough left alive, and others entirely killed; yet suffered  
to



to remain an encumbrance to the ground, and a disgrace to the country !

What avails the number of trees, if they are not productive ? It is healthy bearing trees, which fill the "drink house" and send a surplus to market. Their encumbrance on the soil is nearly the same, whether they are barren or fruitful ; and it may be a moot point, whether, even many of those which are productive, much more than pay for their encumbrance : how ridiculous, then, to spare any reasonable expence in preserving them in a state of health and productiveness ; or to suffer those to encumber the soil, which are past recovery.

SPRING FROSTS are an enemy against which, perhaps, it is most difficult to guard orchard trees. *Dry frosts* are observed to have no other effects than keeping the blossoms back ; consequently, are frequently serviceable to fruit trees. But "*wet frosts*",—namely frosts after rain or a foggy air, and before the trees have had time to dry,—are very injurious, even to the buds. An instance is mentioned in which a flying hazy shower, in the evening, was succeeded by a smart frost : that side of the

trees, against which the haze drove, was entirely cut off; while the opposite side, which had escaped the moisture, likewise escaped the effect of the frost.

Much, however, may depend on the strength of the blossoms. The spring of this year (1788) had its frosts; and all hope of fruit was more than once given up; yet for quantity and quality, taken jointly, there has seldom, perhaps, been so favorable a fruit year. But this year, the buds formed and the blossoms broke forth with unusual vigour; and were enabled, in their own strength, to set common enemies at defiance. On the contrary, the preceding spring, many of the blossoms sickened in the bud; and those which opened were weak and languid:—the consequence was, in the instances I observed, scarcely an apple succeeded.

The assistance, therefore, required from art, in this case, is, by keeping the trees in a healthful vigorous state, to enable them to throw out a strength of bud and blossom; and, by keeping them thin of wood, to give them an opportunity of drying quickly, before the frost set in.

The

The term **BLIGHT** is as common and as vague, in this as in other districts. "Black blighting winds" are talked of everywhere; but no definite idea is anywhere affixed to the expression. That corn and fruit become unproductive without any visible cause; and that fruit trees are liable to be infected with insects, are certainly facts. But whether the insects be the cause or the effects of blights does not seem to be yet settled.

This year, if the alarm from spring frosts was great, that from black blighting winds was terrible. Yet the consequence is an excess of fruit. The cause appears to me evident in the acquired strength of the trees: they had not borne fruit during four years. The "great hit", in 1784, had exhausted them. They were unable to withstand the attack of common enemies. But having, by three years rest, fully recovered their strength and vigour, they, this year, set the same black blighting winds at defiance, which, next year, may render them altogether unfruitful.

Two bearing years seldom come together. Next year, however, will have more than a fair chance to set this rule aside, as the inter-

val of rest has been unusually long. A full fruitage every second or third year is all that is expected.

Are we to suppose, from these circumstances, that because insects are abundant one year, they become few in number the year ensuing? Or, on the contrary, that because they were few in number this year, they shall be numerous the next? It would be much more reasonable to infer, that, the trees having been exhausted the preceding year, by an excessive burden of fruit, are not, without some extraordinary circumstances, able to throw out the succeeding season a sufficient strength of blossom, to withstand the natural enemies, with which they are every year assailed: or if, through extraordinary circumstances, they should throw out sufficient blow, that the fruit, for want of a due supply of sustenance, drops abortively from the boughs.

Hence, *perhaps*, with respect to blights, all the assistance which art can render is, to keep the trees in a state of healthfulness; and prevent, as much as possible, an excess of fruit.

INSECTS

INSECTS are not only hurtful to the blossoms and the leaves, but the larger species, are destructive of the fruit;—especially of pears. In 1783, a scarce year of fruit, the *wasps*, which were that year particularly abundant, destroyed a great share of the pears, that were produced. In a fruit-liquor country, it might be prudent to set a price on the female wasps in the spring; by which means the number of nests might be considerably lessened.

AN EXCESS OF FRUIT has several injurious effects:—it stints the growth of young trees; and renders trees in general barren for two or three years afterward; while the weight of the fruit is frequently fatal. I have this year seen numberless instances, in which the main branches of trees have been split off, solely by the weight of fruit; and very many, in which the entire tree had sunk under the weight of its burden.

The ordinary guards, against the mischievous effect of an excess of fruit, are prop-forked poles—set under the boughs.—Twenty  
of

of these props are sometimes employed in supporting the branches of one tree \*.

It would be difficult to describe the burden, which many trees, this year, had to bear. Notwithstanding the trees were as full of wood as neglect could fill them, every twig, within and without, was loaded with fruit. Of trees of luxuriant growth, the most upright shoots, even to the summit, were rendered pendant with the weight of their produce, hanging down on every side as strings of onions; the fruit appearing, to the distant eye, to cover the entire surface of the tree. I have nowhere else seen fruit trees bear such extraordinary burdens.

The means of preventing, as much as may be, the evil consequences of an inordinate quantity of fruit, in any one year, is to GRAFT IN THE BOUGHS†; and, when the trees are fully

\* These, however, are chiefly used in close orchards; where the lower boughs, being less broken by cattle, are longer and more luxuriant than they are in cowgrounds, where props cannot conveniently be used.

† In most of the instances of fracture, I observed, that the tops suffer by halves. One half being split off this year, or this hit, the fractured part decays, and the next year,  
or

fully grown, TO THIN THE BEARING BRANCHES ; thereby endeavouring, like the gardener, to grow fruit every year \*.

OLD AGE cannot be prevented ; but the natural life of fruit trees may, no doubt, be protracted, by proper management. Stocks of the native crab, grafted in the boughs, is, in this intention; the most eligible basis. As taking off the underling and crossing boughs while growing, keeping the head within due bounds, and lessening the quantity of bearing wood when the heads are fully grown, are the most likely means to give a lasting superstructure.

The stage of decline will nevertheless arrive, and a deficiency in fruitfulness will long precede the general decay.

During

or the next hit, the remaining half breaks off. This is evidently the effect of *grafting in the stock*. The head is formed jointly by the two grafts, which have no other natural bond or connexion, than the ordinary grain of the stem to hold them in union.

\* Young trees, which have been *whipgrafted*, planted out while weak in the stem, and had afterward shot freely, I have seen bowing with their heads to the ground, with the weight of fruit, which had been injudiciously suffered to mature upon them.

During the decline of fruitfulness, there is a stage, in which the the fruit no longer repays the encumbrance, which the ground is subjected to by the tree. Nevertheless, we see trees standing, a burden to the soil, in every stage of decay. But how injudicious, in such a case, is the conduct of their occupiers. If it be a disputable point, whether trees in full fruit be beneficial to a farmer, he may safely conclude, that, after their fruitfulness has in great part declined, they become injurious to him; and if the occupier, through friendship from long acquaintance, or gratitude arising from the many comfortable draughts they have afforded him, cannot muster up resolution to remove them,—those who have the management of the estate should see them taken down, while the wood remains in a valuable state. And not suffer them, while the wood is wasting, to remain an encumbrance to the estate.

In the vale of Gloucester, I saw an instance of some healthy, bearing *apple trees*, which now wear the second tops to the same stems. The first tops, being worn out, were cut off, and the stumps saw-grafted. In orchards,  
about



about a house, this expedient may frequently be eligible.

It is here observable that the same judicious manager, in whose practice I saw this instance of renewing the heads of trees, could never raise young trees with any success, in an old orchard ground. If, in a close orchard, convenient to an habitation in a country where fruit is scarce, such an attempt should be made, the species of fruit ought certainly to be changed; as from apples to pears; or pears to apples.

It is likewise observable, in this place, that pear trees, especially in a strong deep soil, are of much longer duration than apple trees; outliving, it is said, two or three generations; consequently the two species ought never to be mixed together in the same fruit ground.

GENERAL OBSERVATION. Supposing the ground to have been in grass since the trees first acquired their growth, it will, on their removal, be ready for a change of management. The larger roots being removed, suffer the ground to remain in grass, until the smaller roots be decayed; and then break it up for a course of arable crops; in order to  
affimulate

assimilate the roots with the foil, and do away the *fournefs* of fward which low-spreading trees, as those of fruit, will always produce.

Thus, considering FRUIT TREES as a CROP IN HUSBANDRY, the GENERAL MANAGEMENT appears to be this. Plant upon a recently broken-up, worn-out fward. Keep the foil under a state of arable management, until the trees be well grown: then, lay it down to grafs; and let it remain, in fward, until the trees be removed, and their roots be decayed; when it will again require a course of arable management.

## FRUIT

## FRUIT LIQUOR.

THE SPECIES of FRUIT LIQUOR made in this district are

Cider—the produce of apples alone.

Perry—that of pears alone.

“Cider”—produced from apples and pears jointly; and

“Cider”—made from the common wild crab, and the richer sweeter kinds of early pears.

The two last species, and much of the two first, are used, instead of malt liquor, as “family drink”: the quantity of *sale* liquor, except on the larger plantations, being small, in proportion to that which is consumed in the country.

Thus, farmers, in general, considering fruit liquor as the beverage of their servants and workpeople, have no stimulus toward excellency in the art. If it is but “zeyder”  
and

and has body enough to keep ; no matter for the richness and flavor. The rougher it is, the further it will go ; and the more acceptable custom has rendered it, not to the workmen only, but to their masters: the cider which is drank, in this, and all the cider countries, with so much avidity and in such quantity, is a very different liquor to that which is drank in the rest of the kingdom. A palate accustomed to "sweet cider", would judge the "rough cider" of the farm houses, to be a mixture of vinegar and water, with a little dissolved allum to give it a roughness.

Men in general, however, whose palates are set to rough cider, consider the common sweet sort as an effeminate beverage ; and rough cider, properly manufactured, is probably the more generous liquor ; being deemed more wholesome, to habits in general, than sweet cider:—even when genuine. That which is drank, in the kingdom at large, is too frequently adulterated. The "ciderman" *cannot afford* to lose a hogshhead: if it will not *do*, it must be "*doctored*": or if sound, it may not be sweet enough for the palate of his customers ; nor high enough coloured to please the

the eye ; but the requisite colour and sweetness, he finds, are easily communicated.

The great art, however, in manufacturing fruit liquors, whether cider or perry, is that of gratifying the palate and the eye with the juices of the fruit alone. And although farmers in general, more particularly the lower class, are very deficient in the management of their liquors,—there are men, especially among the more substantial yeomanry, and the principal farmers who ferment their own liquors for sale, that are far advanced on the line of right management.

Unfortunately, however, these men, priding themselves, respectively, on the superiority of their liquor (more perhaps than on any other produce of their estates) become jealous of their art; and are not sufficiently communicative with each other. Hence the difference in their several practices; and hence the present imperfection of the art. For although each man may produce good liquor, in his turn, no one, I believe, pretends to *uniform success*;—to produce liquor of the first quality, *with certainty*.

From this class of men, chiefly, I have endeavoured to obtain information. I have seen the practice, in whole or in part, of many individuals; and have had the sentiments of many more on the subject: which, at the same time I went over the district (October 1788) was the prevailing topic of conversation; and, it is not probable, that any material circumstance, relating to it, should have escaped me.

The following detail, however, must not be considered, merely, as the produce of an EXCURSION. For, although the year 1783 was not a general fruit year, there was a sufficiency of liquor made, to enable me to form a general idea of its manufacture. And although the knowledge, then acquired, was not sufficient to fill my register completely in every part, it was enough to enable me to make a complete ANALYSIS of the subject: and, during the summer of 1788, I still kept adding to my collection.

Therefore, *previous* to the excursion in HEREFORDSHIRE, my register was nearly full, and *the deficiencies ascertained*. Consequently, by seeing, there, the practice repeated on a large

large scale, and by conversing freely with professional men on the subject, the deficiencies were filled up, the facts, previously acquired, proved, and the errors, of course, corrected. Beside, since my return, and after I had digested the information acquired, I have had an opportunity of seeing the different stages of the art, as practised by a *professional* man, whose liquors are in the very first estimation.

To adapt a register of this art to the public eye, and to render it as clear, yet full, as the nature of it requires, it will be necessary to describe, distinctly and minutely, its several stages. And, previous to this detail of the art itself, it will be proper to take a view of its requisite APPARATUS.

A MILL HOUSE, on an orchard farm, is as necessary as a barn. It is generally one end of an out building : or, perhaps, an open shed, under which straw or small implements are occasionally laid up.

The smallest dimensions, to render it any way convenient, are twenty four feet by twenty ; with a floor thrown over it, at seven feet high ; with a door in the middle of the front, and a window opposite ; with the mill on one

side, the prefs on the other side, of the window; as much room being left in front, towards the door, for fruit and utensils—as the nature of the mill and the prefs will allow.

The MILL consists of a stone wheel—provincially a “runner”—somewhat in the shape of a corn millstone—running on its edge in a circular stone trough—provincially—the “chace.”

The size of the runner varies from two and a half to four and a half feet diameter, and from nine to twelve inches in thickness; which, in general, is even like that of a grindstone: not varying like that of a millstone: the weight one or two tons.

The bottom of the chace is somewhat wider than the runner, that this may run freely.—The inner side rises perpendicularly, but the outer side spreads, so as to make the top of the trough some six or eight inches wider than the bottom;—to give freedom to the runner, and room to scatter in the fruit, stir it up while grinding, and take out the ground matter. The depth nine or ten inches.

The



The outer rim of the trough is three or four inches wide, and the diameter of the inner circle, which the trough circumscribes, from four and a half to five feet; according to the size of the mill\*.

The entire bed of a middle-sized mill is about nine feet—some ten—some few twelve feet diameter: the whole being composed of two, three, or four stones, cramped together as one; and worked, or at least finished, after they are cramped together.

The best stones are raised in the Forest of Dean. They are mostly a dark reddish grit-stone—(noncalcareous)—working with sufficient freedom, yet sufficiently hard, for this intention. The bed of the mill is formed, and the trough partly hollowed, at the quarry; leaving a few inches at the edge of each stone, uncut out, as a bond to prevent its breaking  
in

\* This is sometimes raised by a table of thick plank fixed upon the stone; with a curb of wood, lessening to an angle, fixed upon the circumference of the trough; making the whole depth of the trough about equal to its width at the bottom. This lessens the quantity of the stone; and the plank upon the center answers a purpose hereafter to be noticed.

in carriage. Much depends on the quality of the stone. It ought not to be calcarious—in whole or in part—as the acid of the liquor would corrode it. Some of the Herefordshire stones have calcarious pebbles in them, which being of course dissolved, leave holes in the stone. Nor should it be such as will communicate a disagreeable tinge to the liquor. A clean-grained grindstone girt is the fittest for this purpose.

The runner is moved by means of an axle passing through the center; with a long arm, reaching without the bed of the mill, for a horse to draw by\*; and with a short one passing to an upright swivel, turning upon a pivot, in the center of the stone; and steadied at the top, by entering a bearing of the floor, above. An iron bolt, with a large head, passes through an eye, in the lower part of the swivel, into the end of the inner arm of the  
axis

\* The horse mostly draws by traces; I saw no instance of the contrary: this, however, is an error: the acting point of draught; the horse's shoulder; ought for various reasons to be applied immediately at the end of the arm of the axis; not two or three yards before it: perhaps, of a small mill, near one fourth its circumference!

axis. Thus the requisite double motion is obtained, and the stone kept perfectly upright (which it ought to be) with great simplicity, and without stress to any part of the machine \*.

On the inner arm of the axis, about a foot from the runner, is fixed (or ought to be, though it is frequently wanting) a cogged wheel working in a circle of cogs—fixed upon the bed of the mill †. The use of these wheels is to prevent the runner from sliding; to which it is liable, when the mill is full; the matter, when nearly ground, rising up in a body before the stone. Besides, by assisting the rotatory motion of the stone, it renders the work more easy to the horse. These wheels require to be made with great exactness; and in a country, where carpenters are unaccustomed

\* This is the ordinary method of hanging the runner. There is a more complex way of doing it; but I see no advantage arising from it. There are some few mills, it seems, with two runners, one opposite the other.

† The diameter of the wheel is determined by the height of the axis above the bed of the mill. The diameter of the ring of cogs, by the distance of the wheel from the center of motion.

tomed to them, a mill wright should be employed in fixing them.

The situation of the mill is such as to leave a horse path, about three feet wide, between the bed and the walls; so that a moderate-sized mill, with its horse path, takes up a space of fourteen or fifteen feet every way.

THE PRESS is situated, as near the horse path, as conveniency will allow, for the more easy conveyance of the ground materials, from the mill to the press.

The principle of the press is that of the packing press and the common napkin press; a skrew working within a square frame.

The sizes of presses are various. The bed, or bottom, is about five feet square, of strong plank, or of stone, placed on sleepers, about a foot from the ground floor; or raised on mason's work, to two or three feet high. On each side rises a strong upright cheek, provincially a "sister;" and across the top (the upper surface level with the chamber floor) lies a nut, of dimensions suitable to the size of the skrew, which is usually about ten inches in diameter. The foot of the skrew is square, with cross holes for inserting a lever; or has a wheel

wheel fixed round it for that purpose. A sinker—provincially the “bridge”—is hung beneath it, and steadied by the cheeks, in the usual manner.

The bed or floor of the press, which is now composed entirely of wood, or of stone\*, has a channel cut a few inches within its outer edges, to catch the liquor as it is expressed, and convey it to a lip, formed by a projection on that side of the bed opposite to the mill; under which lip a stone trough, or wooden vessel, is sunk within the ground, (when the bed is fixed low), to receive it.

The press is worked with levers of different lengths; first, a short one; next, one of a moderate size, by hand; and lastly, with a strong bar, eight or nine feet long, by means of a species of capstone, provincially a “wind-lafs;” an upright post, about six inches in diameter,

\* Formerly it was usually covered with lead; which, by being dissolved by the acid of the liquor, has probably been the cause of much mischief; nevertheless, lead is still suffered to remain about ciderpresses. There is a public mill, at Newnham, whose bed is entirely covered with lead; and I have seen others, whose lips or spouts, and, perhaps, a rim round the outer edge, are of that dangerous material.

diameter, with a pike or pivot at either end; one of them being inserted in the ground floor, the other in a bearing of the chamber. From the upper part of this post passes a very strong rope, with an eye at the end to receive the end of the bar; which has a cross pin, or a shoulder, a few inches from the end, to prevent the rope from slipping. In the lower part of the post, about three feet from the ground, is one or more holes, for a lever or levers. By these means an excessive purchase is obtained.

The UTENSILS belonging to a millhouse are few: the fruit is brought in carts or baskets, and the liquor carried out in pails. The *bair-clóths*, which will be mentioned, are the principal addition to the mill and prefs.

The EXPENCE of fitting up a cidermill house depends on the size and quality of the mill and prefs. One of a moderate size, for a farm, may be furnished, completely, for twenty to twenty five pounds. One, on a small scale, might be furnished for ten to fifteen pounds: much depending on the distance of carriage of the stone,

This

This expence is usually borne by the landlord.

A millhouse substantially fitted up, will last many years. I have observed a mill and press which, by the date upon them, have been set up more than twenty years; yet they appear almost as fresh as new. Many of the old mills and presses, which are seen, may, compared with these, seem to be a century old; or, the mills, more particularly, a greater age; and are probably the *original* mills of the farms they are upon.

The GENERAL SUBJECT naturally separates into the following principal parts.

1. The fruit and its management.
2. Grinding, and the management of the ground fruit.
3. Pressing, and the management of the residue.
4. Fermenting.
5. Correcting.
6. Laying up.
7. Bottling.
8. Markets.
9. Produce.

## I. FRUIT

I. FRUIT. The particulars to be attended to in this first stage of the art are

1. The time of gathering.
2. The method of gathering.
3. Maturing the fruit.
4. Preparing it for the mill.
5. Mixing different sorts for liquor.

I. TIME OF GATHERING. This is varied by the season and the sort of fruit. The *early pears* are fit for the mill, in September. This year (the season early) there was not, in the middle of October, a squash pear left in the country for a specimen.

But there are *few apples* ready for gathering, provincially “picking”—before Michaelmas; though the winds sometimes throw them down, in quantity, before that time. And this year, the drink houses having long been dry, apples were gathered by the time they were fully grown. Many trees were stripped, and their produce made into cider and drank, before Michaelmas.

For sale cider, however, and for “keeping drink”, they are suffered to hang upon the trees, until they be fully ripe. This year, (a forward season), Herefordshire was in the height



height of fruit picking, the latter end of October. In the vale of Gloucester, the fire apple, a somewhat early fruit, was much of it shook down, by the high winds of September; and many orchards were cleared of them before Michaelmas. But the middle of October, in a common season, is esteemed the time of gathering the fire apple.

The *criterion of a due degree of ripeness*, is that of the fruit's falling spontaneously from the tree. Nature is the best judge of this crisis. No art has yet been discovered to mature unripe fruit, in any way equal to nature's process. Fruit, in all human probability, does not quit the tree (in an undisturbed state) until it has received its full complement of nourishment. But having obtained this (or presently afterward) it is probable, that the fruits, under consideration, are suffered to disengage themselves by their own specific gravity: consequently, to force them away, before that period, is defrauding them, in all human probability, of their most valuable particles.

The harvesting of fruit is widely different, in this respect, from the harvesting of grain; which has the entire plant to feed it, after its separation

separation from the foil; while fruit, after it is severed from the tree, is cut off from all possibility of a further supply of nourishment; and although it may have reached its wonted size, some of its more *essential* particles are, it is abundantly evident, left behind in the tree.

Some of the later-ripe fruits, however, will hang on, until they be in danger of being caught in the frosts; which, if severe and lasting, injure it materially for the purpose of liquor. In the great fruitage of 1784—a very considerable part of the best fruits were in a manner lost by the frosts. The buyers of sale liquors fixt their price, for cider, so very low—that the farmers, obstinately, suffered the apples to be frozen on the trees, or in heaps if collected, rather than accept of the price they were offered. The consequence proved disadvantageous to the buyers, as well as the farmers; they being afterwards obliged to nearly double the price, to those who had worked their fruit, or had saved it from the frost\*.

## 2. METHOD

\* With respect to injury by FROST, however, some thing may depend on the nature of the fruit. Weak watery fruit

2. METHOD OF GATHERING. The ordinary method which I have seen used, and which is, I believe, the prevailing practice of the country,—is to send men with long slender poles or rods,—provincially “polting lugs”, to beat the trees; and women, with baskets, to pick up the fruit. I have seen two men and eight women, thus employed, as a set; with an ox wain, and a boy to drive it, to receive the apples as they were collected; *clearing the trees as they went.*

But this is contrary to the foregoing principles. The apples of the same tree differ, perhaps many days, perhaps some weeks, in their times of ripening; owing to aspect, exposure, and perhaps other causes which we are unacquainted with. Consequently, some part of the natural richness and flavor of the fruit is cut off so effectually, that no art can retrieve it: brown sugar and brandy are but mean substitutes.

Nor

fruit, probably, receives the most injury. There is an instance related of liquor, of the very first quality, being made from GOLDEN PIPPINS, after they had been frozen as hard as ice.

Nor may the loss of the richness, strength, flavor and colour, which are left behind in the tree, be the only evil of the ordinary method of gathering fruit for cider. Every thing depends on the vinous fermentation, which the liquor has to pass through. If this be interrupted, or rendered complex, by a mixture of ripe and unripe fruits, and the liquor be not, in the first instance, sufficiently purged from its feculencies, it may be difficult, afterward, to effect the purgation, without injury to the liquor. Brimstone and bullock's blood may alleviate, but cannot altogether remedy the evil.

Some few men, on these principles, or in pursuance of the dictates of their own experience, go over their fruit trees twice: once, when the spontaneous fall begins to take place, *with a hook*, leaving such of the fruit to mature, as will not quit the boughs, with a gentle agitation. And a second time, when those are sufficiently ripened, or winter is likely to set in, *with the polting lugs*; finally clearing the trees.

If art may, with propriety, be used, in this stage of the business, these appear to be the most rational means of applying it.

### 3. MATURING

3. MATURING GATHERED FRUIT. By way of correcting the crudity of the unripe fruit, which in the common practice has been forced from the trees, in the way that has been mentioned,—the whole is laid together in large heaps, in the open air, *exposed to the weather*, until the ripest,—that is to say the richest and finest of the fruit,—is beginning to rot. Thus destroying, by an injudicious application of art, the natural perfection of the whole.\*

Such, at least, is the ordinary management of fruit; under which management three-fourths, or perhaps a much greater proportion, of the cider produced in the district, is made.

There are men, however, aware of the impropriety of the practice; but they differ in their ideas on the means of rectifying it. One is of opinion, that the ripe fruit, having dropped spontaneously

\* In passing through the country, in the wane of the gathering season, the farm houses are seen surrounded with  
• heaps of fruit; exposed not only to the weather; but, of course, to night-robbers! A striking sight;—to those who are strangers to it.

spontaneously, or having been shook down by a gentle agitation of the boughs, should lie ten days under the trees, as it falls ; and then be gathered, and carried immediately to the mill ; without any further maturation. And, in pursuance of this idea, some few orchards, and even cultivated grounds, are seen with fruit lying under the trees, so thick, that the foot could not well be set down among it.

Others object to this practice ; as exposing the fruit ; not only to pigs and other live stock\* ; but to the weather : alleging that rain and dews are injurious to fruit after it has quitted the trees.

Their opinion is, that it ought to drop ripe from the tree ;—to be picked up while dry ; and to be kept dry, under cover, some time afterward to mature ; and, some will have it, to take a degree of *beat* : while others object violently against its heating ; consequently against lofts ; thinking, that it cannot be kept too

\* In a ground of this kind I have observed a sow so much satiated with highly flavored fruit, as to smell, perhaps, at ten mellow apples, before she found one to her tooth ! Sheep, I have observed, eat fruit with avidity. Deer are still more partial to it.

too cool, in the open air; and that rain water is not injurious to it.

Reason and common sense, however, object to this. All vegetable substances, after they are severed from the soil, lose their flavor, at least, in being exposed to the weather. With regard to this, apples, as hay and corn, ought, no doubt, to be harvested dry.

Upon the whole, we may conclude, that, in strictness of management, fruit ought to drop spontaneously from the tree; to be collected while perfectly dry; and to be laid up, under cover, spread abroad of such a thickness as to prevent any injurious degree of heat. It is the opinion of those, who are best able to judge of this matter, and whose practice accord with their opinion, that, in a room, fruit ought not to lie more than ten inches thick; and that in a fruit-loft a thorough air should be preserved.

**FRUIT LOFTS.** Every mill house should have a fruit chamber over it; with a trap door to lower the fruit down into the mill house.

Since this idea struck me, I have seen an instance, in which it is executed, in a most

Y 2                      convenient

convenient manner. The valve is over the bed of the mill, and is furnished with a cloth spout or tunnel, reaching down to the chace; in which the fruit may, of course, be scattered at pleasure.

*No straw* is used in the lofts. Sometimes the fruit is *turned*. But this, I believe, is not a common practice.

The *due degree of maturation of fruit* for liquor is, however, a subject, about which men, even in this district, differ much in their ideas. The prevailing practice (as has been intimated) is to let it lie, in heaps, until the ripest begin to rot, or are actually rotten. But this is wasting the best of the fruit; and is by no means an accurate criterion. Some shake the fruit and judge by the rattling of the kernels: others cut it through the middle and judge by their blackness. But none of these appear to be a proper test. It is not the state of the *kernels*, but of the *flesh*; not of a few individuals, but of the major part of the prime fruit; which renders the collective body fit or unfit to be sent to mill. It is true, a few individuals, or the kernels of the middle-ripe fruit may be some guide to the state of the flesh of the

the



the majority; but why consult a criterion when the subject itself is present? The most rational test of the ripeness of fruit, which I have met with, is that of the flesh having acquired such a degree of *mellowness*,—its texture such a degree of tenderness,—as to yield to moderate pressure. Thus when the knuckle, or the end of the thumb can, with moderate exertion, be forced into the pulp of the fruit, it is deemed in a fit state for grinding. Or, in less practical terms, the proper state of maturation is when the flesh has acquired its highest degree of richness, and the kernels their highest degree of flavor; and while the rind yet retains its brightness and pungency.

4. PREPARING FRUIT FOR THE MILL. But although the right management of the fruit may appear to be pretty accurately understood; and not difficult to be executed; yet, in practice, ripe and unripe fruit are not to be kept separate so easily as theory may suggest. It is tedious to wait the ripening of every apple, and to collect every apple as it drops. Besides, high winds do not always make the requisite distinction; the unripe and those which are sufficiently matured

for gathering, are frequently thrown down together: and if the hook be used the effect is in some degree similar.

In practice, therefore, there is only one method of avoiding a mixture of fruit:—that of SEPARATING IT BY HAND; either when it is laid up; or at the time of sending it to the mill. And it is more than probable, that this is one of the grand secrets of cidermaking; by which those who excel in the art are monopolizing the credit of it. It is matter of astonishment, however, seeing the obviousness of its utility, that it should not long ago have been adopted in common practice.

Some extra trouble and expence is, no doubt, incurred by this practice. But there is no department of *manufacture*, which is not attended with trouble and expence. If the *ware* pay tenfold for it, the expence vanishes, and the trouble becomes a pleasurable employment. In the infancy of the woolen manufacture, for instance, it is probable the entire fleece was carded, spun, and woven together. But now the sorting of wool is become an employment of no small importance. And were the sorting of apples for cider, once  
to

to become the established practice,—farmers would as soon think of sowing wheat and vetches together,—as of grinding unripe, ripe, and rotten fruit together in the cider mill. Yet all the *preparation*, which the apples receive in common practice, at present, is that of picking out the “black rotten”—which is generally known to give the liquor a disagreeable flavor: and, even this work, I understand, is frequently done in a very imperfect manner.

There are, however, some few individuals, who pay attention to this department of the art. In the practice of one man; a dealer, who manufactures his own liquor; more especially still cider; and whose liquors are a proof of the excellency of his practice; I found the *brown* as well as the *black* rotten carefully picked out: even if part of an apple be tainted, the faulty part is cut out; the sound part only being suffered to go into the mill\*. And in that of another superior manager, whose practice may be said to be nearly perfect†, not only the rotten, but the “crabbed”—that is, the

Y 4

small

\* Mr. JONES, CIDERMERCHANT, in GLOCESTER, is the superior manager, whose practice is here spoken of.

† See page 253.

small crude underripe fruit—are picked out, and thrown aside for family drink;—thus selecting the prime fruit, in a proper state of maturation, to be ground, alone, for liquor of the first quality.

5. MIXING FRUITS FOR LIQUOR. In the ordinary practice, no studied composition or selection of sorts is made. The different kinds are mixed, indiscriminately, or without any other distinction than that of keeping the early and the late fruits separate, and the “old fruits” distinct. A judicious assortment of fruits is, however, spoken of as highly beneficial to liquor; but I have met with nothing, in practice, that establishes the position: and it is a well established fact, that the finer liquors are made from select fruits. Nevertheless, it is more than probable, that the liquor of ordinary fruits may be improved by a judicious mixture; and, to those who have much ordinary fruit in their plantations, a proper mixture of it may be an object of attention. A person, in Herefordshire, is mentioned as an adept in the art of commixing: not fruit, however, but liquors which have been separately drawn, and while they are under

der the process of fermentation: while others are said to mix the liquors, *according to their flavors*, after they are manufactured. But these by way of HINTS.

II. Grinding, and the management of the ground fruit.

I. IN the business of GRINDING, the ciderists of this district are far superior to those of the southern counties; where, as has been said, a kind of cider is sometimes made; but where the mill not unfrequently consists of a wooden roller, stuck with hobnails, working against an upright slab, beset in a similar manner. With this petty machine, the apples are broken, or torn, into fragments, that the press may have fuller power over the juice, than it would have, if the fruit were placed in it whole. For there, and everywhere, I believe, except in what are called the cider countries, it is generally considered, that the *cellular juice of the pulp*, only, is the requisite ingredient of good cider.

In this country, however, it seems to be generally understood, that cider made from the juice of the pulp alone, is far from being perfect; as wanting, in a great measure, one  
of

of its most valuable properties—*flavor*—and some will say *colour*: it being likewise, I believe, pretty generally understood, that the finer ciders owe their superior flavor to the *kernels*, and their colour to the *rind*\*.

Hence, in grinding, it becomes requisite to common good management, that the rind and the kernels, as well as the pulp, should be crushed or broken in such a manner, as to enable them to impart their qualities, with greater freedom to the liquor†.

In

\* The Hagloe crab, however, is an *evidence* against this idea. It is one of the palest-rinded apples, which grow; yet produces the highest-coloured cider, which is made. The fire apple is likewise pale-rinded; yet affords a high-coloured liquor. Some are of opinion, that the rind gives the *strength*! Others, that it communicates *flavor* to the liquor. From a slight examination of the rinds of fruit, they appear to be warm and aromatic; qualities belonging to essential oil; and, it is probable, the pungency may pass at strength; while the aroma may communicate additional flavor.

† The effect of the *stalks* of fruit has not, perhaps, been attended to. Attentive managers pick the largest off, in sorting the fruit; but not, perhaps, with sufficient scrupulousness. The stalks of raisins are known, I believe, to have a bad effect on the wine made from that fruit, and those of apples may have a similar effect on cider.

In this intention, the stone runner and chace are much preferable to the petty contrivance mentioned above ; but they are not, in their present form, and under ordinary management, by any means equal to the entire reduction of the fruit. I have never seen any ground fruit go to the press (except in one instance) without having a large proportion of unreduced fragments of fruit among it: whereas, on the principles, which are here adopted, the whole ought to be reduced to a state of mucilage or pap. Nor have I yet seen any residuum come from the press, without a very large proportion of the kernels unbroken: whereas, on the principles received, every kernel should be crushed.

Having observed the simplicity, and high degree of perfectness, with which the sugar-mills grind the canes, or rather press out their juice, between two plain iron rollers, the imperfections of the cider mill may appear the more striking.

But the sugar-cane is a long fibrous body, and readily passes through between the rollers: whereas fruit, being globular, and of a cellular substance, is not easily laid hold of, or if caught,

caught, has no lengthened fibres to induce it to pass, like the cane, between *plain rollers*.

It has, however, been found, that between *fluted rollers* it may be made to pass; and, in consequence, these rollers are in use, though not common. They are of cast iron, hollow, about nine inches diameter, with flutes or teeth, about an inch wide, and nearly as much deep. They are sold, I understand, by the ironmongers of the district. In general, they are worked by hand, two men working against each other. I have seen a pair adapted to a corn mill, turned by water. Between these the fruit passes twice: the rollers being first set wide, to break it into fragments; and afterward closer, to reduce the fragments. But even this is not a perfect engine: in the residuum from the press, many kernels are found. Besides the acid of the fruit is liable to corrode the iron; and this, in return, to tinge the liquor; though neither of these inconveniences are *acknowledged*. In a country, however, where stone is not easily to be had, this may, perhaps, be found the most eligible cider mill.

But



But in this district, where stone is sufficiently plentiful, the stone runner and trough seem to be the most eligible mill, at present known; though it appears to me highly probable, that, with attention and perseverance, a more perfect machine might be invented.

Be this as it may, however, the present mill appears to be capable of IMPROVEMENT.

It is, at present, an *unfinished* machine: I mean when it is first turned out of the workman's hands; time and constant wear, does that, in part at least, which the workman leaves undone.

The acting parts of the machine; those which are to bruise the rind, and crush the kernels; are the face of the roller and the bottom of the trough. But instead of their being adapted to each other, in such a manner as to effect these purposes with a degree of certainty, they are left in such a rough unfinished state, as in a great measure prevents them, during the first fifty years at least, from performing that, which is their principal intention. Instead of being worked over, and fitted nicely to each other, with the square and chissel, they are hewn over with the stone mason's

maſon's peck only ; leaving holes and protuberances, which would ſave even horſe beans from the preſſure ; much more the kernels of fruit. A runner which has been worn two and twenty years, has holes left in it, which would lodge half a dozen kernels with ſafety.\*

To account for this abſurdity ſeems impoſſible. Perhaps the roughneſs was intended to prevent the runner from ſliding ; but the uſe of the cogged wheels has ſuperceded this intention. Perhaps it was left to gather up the fruits with greater effect ; but, ſurely, deep chifel marks, left in the form of flutes acroſs the face, would have answered this purpoſe better ; and would, perhaps, have laid hold of, and fixed the kernels, ſo as to ſecure their being effectually broken, preferable to any other expedient equally ſimple. Or, perhaps, the *cuſtom* was eſtabliſhed, when the uſes of the rind and kernel were not known ; and time has not yet corrected the error †.

Be

\* The argument is, “ if it miſs them this time it will hit them the next.” But why throw away time and the work of a horſe ſo idly ? Why not hit them, with moral certainty, whenever they fall under the runner ?

† Since writing this article, I have been told that the roughneſs is left to “ cut the fruit the faſter” on its being  
firſt

Be the origin of folly what it may, it is painful to observe its effect. In this case, however, the folly, and, of course, its effect, may be easily removed. Having made the face of the roller as true as the square and the chisel can render it, work the bottom of the trough to it; until not a mustard seed can escape them. The kernels of fruit are hard, slippery, and singularly difficult to fix: escaping pressure in a peculiar manner, and with singular alertness.

Another improvement of the common cidermill appears to be much wanted: namely, a method of preventing the materials, in the last stage of grinding, from rising before the runner. And, another, a more mechanical way of stirring up, and adjusting them in the chace.

Until these improvements be made, cidermills must remain, what most of them evidently are, at present, *imperfect machines*.

The

first put into the trough! and that on this ingenious principle, some will peck their runners over, so often as they wear smooth! To such cidermakers I would recommend the hobnail mill, which would come much cheaper, rid work still faster, and save the expence of pecking!

The *method of grinding* is to scatter in the whole quantity to be ground together, at once: or, to ease the horse, at twice; observing to put in the whole before any of it be stirred.—A woman, or more frequently a girl, drives the horse, and stirs up the fruit as it is ground, and beats down what lodges on the sides of the trough, with a large wooden spatula, somewhat in the form of a cricket bat: continuing until the whole be deemed sufficiently ground.

The *quantity* ground at each *mill-full* varies very much; even in mills of the same size. A bag—about four corn bushels—is, I believe, the most usual quantity, for a middle sized mill: but much more than that quantity is sometimes ground at once; and, in one instance, I observed only half that quantity was ground together, in a mill of the middle size. From the observations I have made respecting this operation, it appears a great error to grind too much at once. In the instance, in which half a bag, only, was ground, the work seemed to go off quicker, and to be more effectually done, than when the trough is choaked with a greater quantity.

The

The *quantities* ground in a *day*, by mills of the same size, varies still more.—A man, who has two or three hundred hogsheads of liquor to make, is too anxious to get his work forward, to pay due attention to grinding his fruit; there has been instances of five or six hogsheads of perry being made in one day (working early and late:) but three hogsheads of perry, or two of cider, is, I believe, the medium day's work. While some few men, who know the value of grinding effectually, never suffer more to be made than one hoghead of cider a day: reducing, as nearly as the present mill is capable of reducing, the entire substance of the fruit to a uniform pap or mucilage.

## 2. MANAGEMENT OF THE GROUND FRUIT.

From what goes before it appears, that men, in general, have pretty accurate ideas of the manner, in which fruit *ought to be ground*: though, through a want of leisure, or a want of industry, and, through the present imperfectness of the mill, few men approach them in practice: but with respect to the management of the reduced materials—provincially

VOL. II. Z the

the "MUST,\*"—they are, in general, so far from the line of rectitude, that one would imagine their faint efforts, at reducing the rind and kernel, were made in compliance with custom, rather than on the principle of giving their cider flavor, colour, or any other valuable quality: for, in common practice, the pomage is pressed immediately as it is ground (even though four or five hogsheds a day are made) No sooner is it out of the mill than it is into the press.

By this conduct, the rind and kernel, let their powers be what they may, have no time to communicate their qualities to the liquor.

They

\* MUST. This term is, here, somewhat unfortunately applied. *Must*, in its accepted sense in the English language, signifies *new liquor unfermented*, whether from the winepress, the ciderpress, or the mash vat; but, here, it seems to stand for every thing else belonging to cider-making. The ground fruit, before it go to the press, is called *must*; though from some expressions, in use, it should seem to mean only the fibres or indissoluble parts, which are mixed among the liquor; and the residuum, after pressing, is also termed *must*. The term, on its first introduction, has evidently been misapplied. I shall, therefore, to avoid confusion, lay it entirely aside. In Surrey the *reduced fruit*, if I recollect right, is called *POMAGE*, an apt term for it: *POM-MASH* would be still more applicable.

They are not, like the flesh of the apple, tender cellular pulp; but fibrous and vascular substances; imparting their qualities less freely than the pulp; requiring the formal process of *extrañion* before they part with them wholly. It would be equally reasonable to expect that the whole virtue of hops might be extracted by pouring the wort through them in a sieve, as to expect that the whole of the virtues of the rind and kernels of fruit can be extracted in a few minutes.

This appears so evidently in theory, that it is no wonder men of reflection, and who wish to excel in the art, should let their liquor "lie upon the must" twenty four hours, or a longer time; or that others, more fully impressed with this idea, should, after the pomage has lain, in open casks, twenty four hours or a longer time, *regrind it*.

By this means (supposing the mill to be perfect) the kernels, which were broken in the former grinding, being now no longer rigid untractable substances, are reduced to particles of the smallest size; and are, of course, no longer able to withhold their virtue from the liquor. Consequently, by these means,

the entire apple is given to the cider; and (supposing the mill to be perfect) every thing done, which art, perhaps, can do, with respect to the grinding and management of the reduced fruit,—previous to the pressing.

III. Pressing and management of the residue.

I. PRESSING. Formerly the pomage was packed up, in a pile, on the bed of the press, in *straw*, layer between layer. But at present *hair cloths* are commonly used in forming the pile—provincially the “cheese”—to be pressed.

These cloths are made of common hair-cloth; such as is used, or was formerly used, in covering maltkilns. The texture loose, frequently, perhaps, too loose to be perfect in their intention. The usual size about four feet square\*.

The method of forming the pile varies.—In Gloucestershire, a wooden rim, frame, mould, or gauge,—about three feet square, and four or five inches deep,—is generally used in making the “cheese.”—(a term somewhat awkwardly

\*. The price of these cloths four to five shillings each.



wardly borrowed from the dairy)—In this case, the gauge is set, with great exactness, every way in the center of the press; a cloth spread evenly over it; and the pomage laded into it, with a large wooden dish or other utensil. A sufficient quantity being thrown in to form a layer, from two to three inches thick\*, it is spread evenly with the hands, and worked truly against the sides and into the corners of the mould; the skirts of the cloth laid over smooth, and folded neatly at the corners; a fresh cloth spread on; and filled in a similar manner: first raising the gauge a few inches, so that its upper edge may be level with the cloth when filled. Thus continuing to raise the mould and fill the cloths, until ten or twelve cloths are filled, and the pile is, of course, raised from two to three feet high.

The height of the pile when finished, however, depends much on the state of the pomage: for, as the pile rises, the superstructure

\* It is deemed, by judicious managers, a great error to fill the "hairs" too full; as the thinner the layers, the drier will the subject be pressed.

ture acts as a press to the substrata; so that a considerable proportion of the juice of pears, or of apples which afford much, escapes during the operation.

The pile being raised to the desired height, and the top made smooth and *perfectly level*,—a broad, square leaf, of strong boards, framed firmly together,—somewhat larger than the top of the pile,—is placed upon it; and upon this; logs, or blocks—two-and-two across, are piled, until they reach the bridge; the base of the skrew being previously wound up to the nut; for a purpose which will be mentioned.

In Herefordshire, I observed, in several instances, a different mode of forming the pile. In this method, no guage is used; the whole being done by the eye; nor is the pile carried up either plumb, or square.—The corners are cut off; forming four long, and four short sides; (for the greater conveniency, I suppose, of securing the corners of the cloths) and the dimension of every layer is lessened, as the pile rises; so that when finished, instead of being a cube, or nearly so, as in the first mentioned practice, it forms the lower frustum of  
a pyramid;

a pyramid; being somewhat considerably wider at the bottom than the top.

This, however, appears to my mind an improper form. All fluids endeavour to escape pressure. If it be applied in the perpendicular direction, they endeavour to fly out horizontally. Thus the pomage (a subfluid) is forced toward the outer edges of the cloths; which, in this form of the pile, *have no immediate pressure*:—an indirect horizontal pressure, arising from the natural law of fluids, being all the compression which the outer sides of the pile receive.

The method of applying the power of the press has been described. It is generally worked by one man; who, with the girl that attends the mill, and a man to fetch in the fruit, and carry away the liquor as the reservoir under the lip of the press fills, make a set, for the mill-house.

The pressing is done leisurely: that the liquor may draw off the clearer; and to give the assistant time to keep the reservoir free.—The first runnings come off foul and muddy; but the last, especially of perry, will be as clear,

and as fine, as if filtered through paper:—a sweet palatable beverage.

In giving the last pinch of the press, with the purchase-roller, the man, or men, if more than one be employed, stoop under the rope: hence the use of raising the foot of the skrew as high as may be, before the operation commences; and hence the use of raising the bed of the press; by which means fewer blocks are wanted; and a more convenient receptacle for the juice obtained.

By encreasing the number of hands to three or four, the residuum may be reduced to almost any degree of dryness. Hence the cider PRESS might be styled A MOST PERFECT ENGINE.

2. The RESIDUE. In the common practice of the country, the first residue, is either thrown aside as offal\* (though, perhaps, very imperfectly pressed) or is returned (designedly underpressed) to the mill, to be “washed:”  
that

\* The OFFAL or “dry must” is considered of little value as manure (but I know not why.) I have observed poor people carrying it away as fuel. Pigs will eat some part of it; especially when it has been underground and underpressed.

that is, to be reground, with water, for “family drink \*.” Thus throwing away, or applying to a mean purpose, what might, in familiar language, be termed the ESSENCE OF FRUIT LIQUOR! The juices of the rind and kernels; which,—common sense would tell us, were we not told it by men of experience and observation—come off most plentifully with the last runnings †

Hence, men, who excell in the art, continue to press so long as a drop can be drawn; and, unsatisfied with this, return the FIRST RESIDUE to the mill, to be REGROUND; not with water, but with some of the first runnings of the liquor; moistening the materials to be ground as occasion requires.

It

\* SMALL CIDER. When the plantations are large in proportion to the farm, a sufficient quantity of family liquor is obtained, in a plentiful year of fruit, from the washings of the residue, to last the year round, or a longer time:—where the plantations are proportionally small; and in a scarce year; water is thrown into the mill, while the fruit is grinding; thus lowering the quality, and encreasing the quantity of the liquor. In harvest, it is customary to allow some malt liquor, or cider “of the best making.”

† It is allowed, however, by experienced managers, that the *richest* of the liquor comes off with the first runnings.

It is found, that even breaking the cakes of refuse with the hands, only, gives the press fresh power over it: for though it has been pressed to the last drop, a gallon or more of additional liquor may be got from a press full by this simple means. Regrinding them has a still greater effect.

In this state of the materials, the mill gains a degree of power over the more rigid parts of the fruit, which, in the first grinding, it could not reach. If the face of the runner and the bottom of the trough were dressed with a broad chisel, and made true to each other in the manner which has been proposed; and a moderate quantity of residue were ground at once; scarcely a kernel could escape unbroken; or a drop of liquor remain undrawn.

GENERAL OBSERVATIONS ON GRINDING AND PRESSING. From the foregoing observations it appears, *first*, that the fruit should be entirely reduced, before the whole of its virtues can be communicated to the liquor. There is, however, one inconveniency in grinding the fruit very fine: the substance, as well as the liquor, escapes the hair cloth, and fills the fermenting vessel unnecessarily: besides, perhaps,

perhaps, being injurious during the process of fermentation. But this effect may be remedied: I have seen an instance, in which the first runnings were poured through a hair sieve to catch part of their foulness: a piece of hair cloth thrown over the "tun dish"—would, perhaps, be still more effectual. The malt-liquor mash-tub is furnished with a hose, which stops a great part of the feculencies. The liquor, in that case, comes off almost clear; and, *perhaps*, fruit liquor ought to be rendered equally clear, before it be committed to fermentation. This degree of purity is obtainable, by suffering the foulness to subside, in the first cask, and drawing off the clear liquor, into a fresh vessel, previous to the commencement of the fermentation. By this means, the fermenting vessel, as well as the process of fermentation, may be freed at least from the grosser foulness. In some cases, by catching the critical time, and by filtering the lees in the manner which will be described, the *must* may be rendered almost perfectly clear.

*Secondly*,—that the reduced fruit ought to remain some time, between the grinding and the pressing, that the liquor may have an opportunity

portunity of forming an extract with the rind and kernels. It is observable, however, that the best cider, which the art, perhaps, has yet been able to produce, was made under different management. But it ought likewise to be observed, that the judicious manager of this cider, grinds only one pressful (affording perhaps not quite an hogshead of liquor) a day; consequently the first-ground fruit, has most of the day to make the required extract; and every succeeding mill-full has a proportionate time; and although the liquor, under this management, proved excellent, yet had more of the bitter and fragrance of the kernels been communicated to it, it *possibly* might have been better\*.

*Thirdly*,—that the present imperfections of the mill are such as render it almost impossible to reduce the fruit, sufficiently, by a single grinding: but the juice, or a principal part of it, having been drawn off by the press, the residue is capable of receiving the requisite degree of reduction.

Hence,

\* An objection to this practice is, that it hurts the *colour of cider*; and the most experienced managers object to its lying more than twelve hours on the must.



Hence, upon the whole, the most eligible management, in this stage of the art, for those I mean who have leisure to pursue it, appears to be this:—grind one pressful a day: press; and regrind the residuum in the evening. Infuse the reduced matter, all night, among part of the first runnings; and, in the morning, repress, while the next pressful is grinding.

IV. FERMENTING. In this department of the art, the nicest judgement is requisite. The former are mere manual operations. The right principle being adopted, and a suitable apparatus being prepared, the execution requires no great share either of genius or experience. But in conducting the fermentation properly, much skill, and a close attention are requisite.

In the prevailing practice of the district, the liquor is “TUNNED”;—that is, put into hogshheads or other casks;—immediately from the press. The casks, in the ordinary practice, being *filled* to the bung hole. Some judicious managers, however, object to the filling up of the casks; esteeming it more eligible management to leave them about a  
“*pailful*”

"*pailful ullage*". While others, still more deeply versed, perhaps, in this mystery, leave an *ullage in proportion to the ripeness of the fruit*: thus, with liquor from underripe fruit the cask is filled; but with that from fruit which is more mature, an ullage is left, in proportion to the state of ripeness.

With respect to the TEMPERATURE of the AIR, in which fruit liquor ought to be fermented, nothing *accurate*, I believe, is to be learnt in this district. Even the professional dealers, I understand, are strangers to the use of the thermometer! It is, however, generally understood,\* that fermenting liquors should not be exposed to frost\*. But, in the commencement of the season, it is thought they cannot be kept too cool. In the middle of October, the air then about 60°. the casks were placed in sheds, or in airy buildings of the same, or nearly the same, temperature as the common atmosphere; and frequently in the

\* Nevertheless it has been remarked, that frost, previous to the commencement of the fermentation, though it formed a sheet of ice on the surface, had no observable bad effect.

the open air\*. Later in the season, the casks are placed in close buildings; with windows, however, to admit occasionally a thorough air; which is generally thought to be salutary to fermenting liquors. I have, nevertheless, seen liquor of the most delicate kind fermenting in a close hovel, without a thorough air†.

NO FERMENT whatever is made use of. I have not, at least, on repeated enquiry, met with one instance of any being used: even the most intelligent seem surprized at the enquiry. Let the species of fruit, the degree of ripeness, and the weather be what they may, the liquor is left to fight its way with its own weapons.

Hence

\* In this case the casks have a small piece of file or flat stone set over the bung hole, propped by a wooden pin in a leaning posture to shoot off rain water &c.

† FERMENTING ROOM. In a complete manufactory of fruit liquor, the fermenting room should be under the same roof with the mill house; a continuation of the press room; or at least opening into it: with windows or doors on every side; to give a free admission of air; and with suitable baracades to guard against severe frost; with fruit lofts over it; and, beneath it, a vault for laying up the liquors, after fermentation; with small holes in the crown of the arch, to admit a leathern pipe; for the purpose of conveying the liquors, occasionally, from one situation to the other. The dealer's warehouses are fitted up in a manner somewhat similar to this.

Hence the COMMENCEMENT of the fermentation is entirely uncertain. Perhaps, the first, perhaps the second, perhaps not until the third day, or perhaps in cold weather not until a week, or a month, after the liquor be tunned. It is observable, however, that liquor, which has been agitated in a carriage, though taken immediately from the press, will sometimes, on being laid down, pass, almost immediately, into the state of fermentation.

The CONTINUANCE of the vinous fermentation (or more accurately speaking the first stage of it) is not less uncertain than its commencement. Liquor, under the last-mentioned circumstances, will pass through it, perhaps, the same day. But less agitated liquors, I believe, seldom go through it in less than two or three days; will sometimes continue under it five or six days.

With regard to any CRITERION whereby to judge of the fermentation, as to its being *perfect*, *imperfect*, or *inordinate*, I have not been able to collect a single idea worth registering. It is a subject, to which most cidermakers appear to have paid little or no attention:  
notwithstanding

notwithstanding they are fully aware of the change, which takes place during this natural process; learning, from their own experience, that the liquor owes its intoxicating quality entirely to fermentation. It is true, the manufacturers of "sweet cider" pay some attention to the fermentation: but their whole art appears to consist; not in *regulating* it to any *certain degree*; but in checking it with every means in their power; preventing,—*as much as they are able*,—any degree whatever of the vinous fermentation from taking place!

It is observable, that fermentation operates somewhat differently on different liquors. Thus, ciders made from fruits properly matured, generally throw up a gross spume, resembling that of malt liquor; forming, on the top, a brown crust, of a thickness proportioned to the species and ripeness of the fruit; the riper the fruit the more "brown must" is thrown up. Perries, on the contrary, throw up little spume, and seldom cover it with a brown crust; nevertheless, I have seen barland perry with a head resembling that of cider; which, it is observable, is sometimes, like per-

VOL II.                      A a                      ries,

rics, unable to form ahead; or is intentionally prevented from doing it, by management.

Having remained some days in the first vessel, the liquor is drawn off the lees, and put into fresh casks: an operation termed RACKING.

It appears to be fully and universally understood, that there is a CRITICAL TIME OF RACKING, on which the future quality of the liquor very much depends. Hence, in the dealer's warehouses, persons are employed to sit up all night, to catch the critical minute. But what is rather extraordinary, men differ in their ideas with respect to the proper juncture. The prevailing idea seems to be, that the proper time to rack is at the close of the first fermentation, *while the liquor is clear*: embracing the critical time between the subsiding of the foulness caused by the motion,—and the falling of the spume; a circumstance which frequently takes place a short time after the fermentation ceases; whereby the liquor is not only fouled, but is probably furnished with the seeds of a fresh fermentation.

But rational as this theory may seem, there are men, whose characters class high as managers

gers of fruit liquors, yet who think it right to rack before the fermentation ceases ; while the liquor is yet foul !

In common practice, however, the liquor itself is seldom examined in judging of this nice point ! Secondary CRITERIONS are applied to. Thus cider, in the practice of some men, is racked when the brown crust becomes firm enough, and dry enough, not to stick to the finger on being touched ; while others stay until the crust crack, and the white scum which has formed under it begin to rise through the cracks. The ordinary criterion of the time for racking perry is “ before it has done hissing”. In the particular practice abovementioned the guide is “ when it begins to twinge the nose” : that is when the gas flies off in quantity ; which it does when the liquor is at the top of fermentation. While the makers of *sweet* liquors will not even hear them hiss, if they can possibly prevent the disagreeable sound !

The METHOD OF RACKING is to draw off the clearer liquor, at a tap fixed above the lees, and to put it immediately into a fresh cask, duly seasoned. When it begins to run

A a 2

foul,

foul, the tap is stopt, and the remainder is filtered through flannel or canvas bags\* ; or for want of these, through a hair cloth ; the four corners being hung upon a hook ; thus forming a kind of bag adequate to this purpose. The intention being merely that of separating the liquor from the lees and scum. The filtered liquor, which ought to drop fine from the bag, is added to the rest ; from which it differs in three notable qualities : It is higher-coloured than that which has not mixed with the lees : it is no longer prone to fermentation ; on the contrary it is found to check that of the liquor racked off ; and, another, if it afterward lose its brightness it is difficult to be recovered.

The degree of FULLNESS OF THE FRESH CASK seems to be pretty generally the same : the cask is not filled up ; but left with about a pailful

\* FILTERING BAGS are made in the form of jelly bags—the mouth wide enough to receive a wooden hoop, a foot or fourteen inches in diameter : the depth eighteen inches or more, tapering to a point at the bottom. Where much racking is done, these bags are hung in a frame, about three feet high, holding perhaps a dozen bags, with tubs placed underneath to catch the filtered liquor.



pailful ullage; so that the surface of the liquor can just be touched with the finger ;—*the bung being still left out.*

THE NUMBER OF RACKINGS depend on the state of the liquor, and the judgement of the manager. If the fresh fermentation, which mostly commences, in some degree, after racking, become violent, it is generally understood, that the liquor ought to be racked again, to check it. Hence, in the practice of some men, the same liquor will be racked five or six times. On the contrary, if a small degree of fermentation, only, take place; which is, in this case, termed "*fretting*"; it is, in ordinary management, suffered to remain in the same cask: but the degree of fretting, which requires the operation of racking, is by no means settled: one man would rack the same cask of liquor, which another would leave for time to quiet. In the common practice of farmers, cider is seldom or ever racked more than once; and perry is sometimes suffered to remain, until time render it *quiet and fine*, in the first cask, into which it was tunned.—The general idea seems to be, that frequent rackings *weaken* the liquor,

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and that much fermentation *roughens* it. The farmers, therefore, rather choose to be at the risque of losing the richness than to lower the strength and bestow upon it the labour of racking.

But those who manufacture the finer liquors for sale; especially, perhaps, those who have checked the first fermentation; think it prudent to repeat the rackings, until the liquor will lie quiet, or nearly so. If it cannot be brought into this state by ordinary racking, the fresh casks are fumigated with sulphur; whose fumes are found to have a power of silencing, or greatly checking, the fretting. This expedient is termed "stumming the casks."

The METHOD OF STUMMING them is this: matches, made of thick linnen cloth, about ten inches long, and an inch broad, thickly coated with brimstone about eight inches of their length,—being prepared; and the cask properly seasoned; every vent is tightly stopt, except the bung-hole; a match kindled; lowered down into the cask; and held, by the end undipped, until it be well lighted, and the bung be driven in; thus suspending the lighted  
match

match within the cask. Having burnt so long as the contained air will supply the fire, the match dies; the bung is raised; the remnant of the match drawn out; and the cask suffered to remain, before the liquor be put into it, some two or three hours, more or less according to the degree of force required. For a few days the liquor retains a sulphurous flavor, which, however, in a short time vanishes, and no evil effect, I understand, is found to follow the operation.

Thus far the method of FERMENTING IN CASKS: a mode of fermentation, which ninety nine hogsheads of a hundred, made in the country, are subjected to. Nevertheless there are some few men, in different parts of the district, who ferment in VATS or other OPEN VESSELS.

One instance of this practice I met with in the vale of Gloucester. In this instance the liquor is set in cows or other open tubs, or in casks with one of the heads out. In these vessels it stands until the first fermentation be pretty well over; when *the spume is carefully skimmed off*; under the idea that it is the scum mixing with the clear liquor, which causes it

to fret after racking. The fermentation having ceased, and the lees subsided, the liquor is racked off into a fresh cask, and the lees filtered in the manner which has been described. In this practice, the liquor is never racked a second time.

Another instance of fermenting in open vessels occurs in a practice which has been repeatedly mentioned; and which is entitled to the highest attention\*. It is generally spoken of as being, what I apprehend it really is, the first practice in the country. In this instance, the liquor is fermented in BROAD SHALLOW VATS; not less than five feet diameter, nor much more than two feet deep; each vat containing about two hogsheads. In these vats the liquor remains until it has done "rising;" that is, until the fermentation has ceased, or nearly so; when it is racked off, *without skimming*; the critical juncture being caught before the spume begin to fall; the whole sinking gradually down together, as the liquor is drawn off. In this practice, likewise, the liquor, notwithstanding its superior quality, is seldom racked a second time.

GENERAL

\* See page 253.

## GENERAL OBSERVATIONS ON FERMENTING.

Chemists enumerate three species of fermentation. The *vinous*, the *acetous*, and the *putrefactive*.

The juices of some vegetable productions; as those of fruits which are inclined to sweetness; will, while recent and in their natural state, with a due degree of heat, and a free communication of air, pass spontaneously into the first or VINOUS FERMENTATION: will acquire heat and motion; become turbid; and, at length, disentangle themselves from their impurities: throwing down part to the bottom of the containing vessel, part up to the surface; leaving, in the middle, a VINOUS LIQUOR,—furnished with a greater or smaller quantity of INFLAMABLE SPIRIT. Thus *wine*, *perry*, *cider*, and the different kinds of *ale* are vinous liquors; their various degrees of *strength* being given by the quantity of inflammable spirit they respectively contain.

The vessel still remaining in a moderate degree of heat, and being still kept open, so as to allow a free admission of air, the vinous liquor will pass on to the second stage of dissolution—the ACETOUS FERMENTATION: by  
which

which the inflammable spirit will be thrown off, and another precipitation of gross matter will take place; and the vinous liquor will now be changed into a dilute vegetable acid, or VINEGAR; of a *strength* proportioned to the quantity of spirit thrown off.

The subject being still exposed, the third or last stage, at length commences. The vinegar becomes PUTRID; its acid is destroyed; and the remaining contents of the vessel are found to be, simply, common EARTH. and WATER.

This being the nature of the expressed juices of fruit,—the first object of the ciderist is to bring on a due degree of vinous fermentation; and his second, to prevent the vinous liquor from passing on to the acetous fermentation.

But, notwithstanding this general THEORY OF DISSOLUTION, science remains destitute of a satisfactory THEORY OF THE VINOUS FERMENTATION. I have not, at least, after some search, been able to find any other than arrangements of well sounding words, pleasing enough to the ear, but affording the understanding no gratification.—Even the first mover, the innate stimulus, the NATURAL PRINCIPLE

PRINCIPLE of this species of fermentation does not evidently appear.

In collecting and registering the foregoing particulars, respecting the fermentation of fruit liquor, many theoretic, as well as practical ideas were suggested by reflection. But though the former may contain a principal part of the theory required, they are, at present, in a state altogether unfit for publication.

Therefore, all I shall attempt, in this place, is to explain more fully the GENERAL EFFECT of the vinous fermentation, on the fruit liquors under notice, and endeavour to draw some practical inferences.

The most striking effect is that of its giving STRENGTH to the liquor which, before its operation, was not possessed of that quality: effecting almost a total change of its original nature: not only by furnishing it with an intoxicating quality, which it was entirely free from; but in reversing, in a remarkable manner, its medical, and, of course, its dietetic properties.

Another notable effect is that of its destroying, or lessening, the SWEETNESS of the liquor. The loss appearing, from the information I  
am

am in possession of, to be in proportion to the strength acquired.\*

Hence the difference between *rough* and *sweet* liquors: the fermentation of the former has continued until the whole or a principal part of its sweetness was destroyed: that of the latter has ceased, or been checked, while a principal part of its sweetness remained.

It does not follow; however, that roughness is a proof of strength, or sweetness of a want of body. Much depends on the nature of the fruit; and much, probably, on its state of ripeness. Rich well ripened fruits afford sweetness enough to furnish a sufficiency of strength, and enough more to retain a sufficiency of richness in the liquor. On the contrary, liquor drawn from harsh and underripe fruit is exhausted of its sweetness, before it has acquired a redundancy of strength. Or, if the fermentation be checked to preserve its sweetness,

\* This, as a general position, will, perhaps, be objected to. Good cider is said to be made from ill tasted fruit.—The hagloe crab is mentioned as an instance. But the harshness of this apple proceeds, I apprehend, from its flesh, its fibres, not from its juice; which, when fully matured, accords sufficiently with the idea here offered.



sweetness, it is rendered, of course, deficient in strength.

Hence the crude flatulent quality of the common sweet liquors; which are either weak thro' a want of fermentation; or, having been sufficiently fermented, have afterward been sweetened by art. A kind of liquor which is palatable enough to *taste*, but which, on being *drank*, soon becomes nauseous to the palate.

And hence the preference to be given to liquors of a MIDDLE RICHNESS: strong without roughness, and rich without sweetness. A generous liquor, this, which, to use the good fellow's phrase, may be *sat by*. A liquor, which is seldom met with out of this district, and not frequently in it. A liquor, nevertheless, which, I am fully persuaded, men, in general, would prefer to most foreign fruit liquors that are, at present, imported—in disgraceful abundance.

In these observations, the methods of producing the different species of fruit liquor: namely, the rough,—the sweet—and the generous, pretty evidently appear.

TO PRODUCE ROUGH LIQUOR,—chuse austere fruits: grind them in a crude, under-ripe

ripe state; and subject the liquor to a full fermentation.

TO PRODUCE SWEET LIQUOR,—make choice of the sweeter fruits: mature them fully; and check the fermentation of the liquor.

The ordinary *methods of checking the fermentation* have been mentioned to be those of racking the liquor, and fumigating the fresh cask.

But *the use of racking* is differently understood. The prevailing idea seems to be, that the fresh fermentation, or the fretting, is caused by the spume or dregs of the preceding; and that by racking the liquor off clear, into a clean vessel, the foulness is got rid of.

But the manufacturers of sweet liquors rack under different motives. Their idea is, that racking *cools the liquor*; and, by that means, checks the fermentation. They observe that the smaller the stream, in racking, the more the fermentation is restrained. And, in pursuance of the same idea, they frequently spread the liquor, thin, in open vessels; and sometimes agitate, or rather ventilate it, in this situation; and obtain the desired end by these expedients.

It

It appears to me, however, that the end is gained, not altogether by giving coolness to the liquor (though in some degree it may) but by giving the *principle of fermentation an opportunity of flying off*. Filtering the liquor, drop by drop, is found not to check, but to destroy the fermentation. Filtered liquor is found even to lower the fermentation of others: not, certainly, by its actual coolness; because in this it can differ very little from liquor which has been racked; the atmosphere, in both cases, presently reducing them to the same temperature; but, probably, by the fermentative principle having escaped, wholly, from the one, its proportion is, consequently, lessened, in the other.

Hence (by the way) it is probable, that by filtering the fresh liquor from the press, a valuable antiscorbutic might be obtained: and, under the same idea, it appears probable, that sweet liquors, duly manufactured, may have their medical virtues.

But leaving this idea to those whom it more concerns; and such liquors to those who may require them; we will proceed to the production of one of a more generous nature. A liquor,  
which

which those who drink for fashion or amusement, or to heighten their friendships, or lighten their cares, should encourage; and which the manufacturers of sale liquors will then, of course, endeavour to produce. At present, their whole skill is exhausted on the art of rendering their liquors unfit for ordinary drinking. They are not, at present, saleable, unless they are sweet!

TO PRODUCE LIQUORS OF A MIDDLE RICHNESS. Much depends on the nature of the *fruit*, and much on the *season* it is matured in. The fruits to be made choice of are such as yield juices capable of affording a sufficiency both of richness and strength. Such are the fire apple, the hagloe crab, the longney ruffet, the Woodcock apple, the squash pear, and, probably, numberless other sorts, were their respective natures individually examined.—Nevertheless, it is probable, there are others which are altogether unfit for this purpose; consequently, altogether unfit to encumber the ground they grow on.

Much, however, depends on proper *management*. From what has gone before, it appears, that to produce a free fermentation,  
air

air and heat—*atmosphere* and *warmth* are requisite. Warmth to set in action the fermentative principle. Atmosphere to receive the loosened particles to be thrown off. But it also appears, that the ordinary heat of the atmosphere is, generally, more than sufficient to give the required degree of motion; and that, in the manufacturing of the fruit liquors under notice, *coolness*, rather than warmth, is requisite.

Hence the preference to be given to *open vats*; which at once preserve the required coolness; thereby preventing too furious a fermentation from taking place; and, at the same time, admit a sufficiency of surface, to render that which does take place, free and uninterrupted.—Two hogshheads of liquor, spread in the vats which have been described, expose some yards of naked surface: while the same quantity of liquor in casks, filled to the bungs, have only a few inches. The disproportion of surface more than a hundred to one.

Hence it appears to me evident, that if liquors be fermented in *casks*; which, only, perhaps, can be conveniently used on a large scale; they ought not to be filled; nor ought

they, in my opinion, to lie on the bulge, in the usual manner; but to be set on-end, with the heads out; and to be filled to such a height, only, as will produce the requisite degree of fermentation.

In whatever situation the liquor is fermented, I am clearly of opinion, the first effort of fermentation ought not, under ordinary circumstances at least, to be frustrated. But, on the contrary, the liquor ought to be allowed one full free fermentation; the degree being regulated, not by compulsory means, but by the depth of the liquor; and this by the heat of the air in the fermenting room, and the quality of the liquor.

But having passed through the first stage; having been racked in the proper juncture; and being found to have acquired a sufficient body, it may be right to prevent, as much as possible, a fresh fermentation. Rack, spread thin, or even filter, to keep it in the desired state.

V. CORRECTING. This is, provincially, and aptly enough, termed "Doctoring:" for the want of it implies disease. My enquiries, however, have been directed to the art of producing

ducing sound liquor, rather than to that of healing the unsound. Nevertheless, on digesting the general mass of information collected on the subject, I find a few ideas have, as it were spontaneously, offered themselves, on this department of it.

The imperfections which art undertakes to supply are,

The want of strength,  
The want of richness,  
The want of flavor,  
The want of colour, and

The want of brightness; consequently, with the addition of the other two qualities of fruit liquor, acidity and aquosity, or in plainer terms vinegar and water, we have in our power, the whole art of making cider, without the trouble of planting orchards.

The want of *strength* is supplied with brandy or other spirits, in sufficient quantity, to prevent liquor which has been made from under-ripe fruit, and has been imperfectly fermented, from being carried off by the acetous fermentation.\*

The

\* I am informed, that the dealers draw a spirit, for this purpose, from the residuum of the press, macerated in water, and distilled in the usual manner.

The want of *richness* is supplied by what are generally termed *sweets*,—prepared in a manner which I have not enquired after; nor has it fallen incidentally under my notice.

To supply the want of *flavor*, an infusion of hops is sometimes added. This is said to communicate an agreeable bitter, and at the same time a fragrance; consequently becomes a substitute for the juices of the rind and kernels, thrown away to the pigs and poultry, through insufficient grinding; or given to the servants, through a want of proper pressing.

The want of *colour* is sometimes supplied by elder-berries, ground among the fruit.—These are said to give a fine colour, and a kind of flavor, which is not disagreeable.—But they are made use of, I understand, by individuals, chiefly or solely, in making liquor for their own drinking. The universal colouring of the *profession* is burnt sugar, which gives the desired colour, and a degree of bitter, that is highly commended. There are two ways of preparing this colouring: one of them, by melting the sugar on a salamander, and suffering it to drop, as it melts, into water;—the other, to boil the sugar (in this case  
brown



brown sugar) over the fire, until it acquire an agreeable bitter; then pour in boiling water, in the proportion of a gallon to two pounds of sugar, and stir until the liquor become uniform. A pint of this preparation will colour a hoghead of cider,

*Brightness* is obtained through different means. In stubborn cases, when the foulness is great, and the liquor will neither "fine nor fret"—being what is technically termed "fulkey"—yet is under circumstances which require that it should presently put on a cheerful countenance—it is drenched with "bullocks blood:" namely the blood of cattle or sheep: the blood of swine is rejected with judaical scrupulousness,

The method of preparing and administering the blood is this. The only preparation of it is that of stirring it well, as it is drawn from the animal; to prevent its parts from separating. Stirring it one way is not deemed sufficient; it ought to be stirred both ways, for about a quarter of an hour. The next thing is to enquire whether the liquor be in the mood for "taking the blood;" which it is not, it seems, equally at all times. This is done by repeat-

B b 3 ing

ing experiments with it in a phial: if it will take the blood in a vial, it will take it in the cask. A quart, or less quantity, is sufficient for a hogshhead. After the blood is poured in, the liquor should be violently agitated, to mix the whole intimately together. This is done by a stick, slit into four quarters, inserted at the bung-hole, and worked about briskly, every way among the liquor, until the whole be evenly blended. In about twenty four hours, the blood will be gone down, and the liquor ought to be racked; for by "lying upon the blood," even two or three days, the liquor is liable to receive a *taint*, which is not easily got rid of. A most extraordinary effect of this process is, that the blood carries down, not only the feculency, but the colour, of the liquor: rendering it, though ever so highly coloured, limpid almost as water! This, however, is a loss which is the less regretted; as the means of restoring it are so easy and so effectual.

The other "forces" made use of in giving brightness to cider, are the common ones of eggs, and isinglass; (or a combination of the two;) used as in the practice of WINE merchants;

chants; who, as well as the dealers in CIDER, have of late years, it seems, made a free use of "THE BLOOD."

VI. LAYING UP. This is one of the most difficult steps to be taken in the management of fruit liquor; yet appears to be the least attended to or understood.

The common practice is to bung up the casks in some particular month, or at some certain time; without any guide to discriminate the critical juncture, when each individual requires to be shut up. Thus the early made liquor lies open until January or February; that made at Christmas is sometimes left open until March or April.

The intention of securing the liquor from the outward air is, evidently, that of preventing the vinous liquor from pursuing its natural propensity; that of entering the *acetous fermentation*: which, according to the general law of nature, all vinous liquors become liable to; as has been already observed; on their being exposed to the outward air, and a moderate degree of heat. Hence, liquors which have passed the vinous fermentation, and are kept open until the warm air of spring begins

to exert its influence, necessarily become vinegar; or enter into a stage of dissolution, which, if not timely interrupted, terminates in vinegar. Hence the number of casks of liquor, which are every year lost, or materially injured, through a want of due attention to the time of laying up.

The only CRITERION I have met with for judging the critical time of laying up is, when a fine white cream-like matter first begins to form upon the surface. But this may be too late; it is probably a symptom, at least, of the acetous fermentation, which if it take place in any degree must be injurious. Yet, if the casks be bunged tight, some criterion is necessary; otherwise, if the vinous fermentation have not yet finally ceased, or should recommence, the casks will be endangered, and the liquor injured. Hence, in the practice of the most cautious manager, whose practice I have had an opportunity of observing, the bungs are first driven lightly, when the liquor is fine and the vinous fermentation is judged to be over; and, some time afterward, when all danger is passed, to fill up the casks, and drive the bungs in securely, with a rag, and rosin

rosin them over the top. Some open the casks again at six weeks, to refill them; others think this unnecessary.

It is an idea, pretty generally received I believe among the farmers at least, that liquor, after it has done fermenting; that is to say, presently after the last racking; should have "SOMETHING TO FEED ON":—hence some feed it with parched beans; others with egg shells; others with mutton suet, to the quantity of half a pound cut into pieces as big as the finger, to each hoghead; and a variety of other things are put in "to make it keep." There are men, however, who consider this as a vulgar error:—being of opinion, that liquor cannot be laid up too clean. Nevertheless, it appears to me more than probable that, when there is danger to be apprehended from the acetous fermentation, *something* may be useful. Ifinglafs is thought, by a most intelligent manager, to be serviceable in this intention; which is, in my idea, that of fixing the principle of the acetous fermentation; or at least clogging it so far as to lessen its activity.

The

The dealers lay up much of their liquor in *large casks* containing from four or five to eight or ten hogsheads (of 110 gallons) each. In these casks, good cider will lie many years. In *hogsheads*, it is sometimes kept three or four years. But it is, observable, that if cider be kept too long in cask, it loses much of its richness and flavor—growing what is provincially called “stummy”—loses its mellowness and becomes heady. This, *perhaps*, is owing to a *decay* of the richness, which, before, sheathed part of the spirit, but being now lost, the spirit obtains full power of action.

The usual *place* of laying up liquor is a cellar or a vault ; or for want of this, a room so situated as not to be liable to sudden change of heat and cold.

VII. BOTTLING. The proper *age*, at which to bottle, depends on the quality of the particular liquor to be bottled. Good cider is seldom fit for bottling, before it be a year old. It is sometimes unfit for this operation until it be two years old ; something depending on the size of the cask, as well as on the quality of the liquor ; the larger the casks the longer

longer the liquor may be suffered to lie in them.

In bottling, as in almost every other step to be taken in the art under notice, there is a *critical time*, which ought to be observed, and which, in this case, is not difficult to be ascertained. Whatever degree of richness and flavor the liquor has at the time of bottling, the same, or nearly the same, qualities it will preserve in bottles, for many years. Hence the critical time of bottling is, when the liquor has acquired, in cask, its highest degree of perfection; whether that juncture happen in one or two years, or in a longer or shorter time.

A person, who has paid especial attention to this subject; and whose liquor is become in a manner proverbial throughout the district; has observed, that liquor which has been bottled in the fulness of its richness and flavor, has been friendly to the habit, passing off chiefly by insensible perspiration; while the same liquor, suffered to remain in cask, until it had passed this juncture, became armed at all points; distracting to the head, in the  
first

first instance, and injurious to the whole frame.

It is needless to say, that the liquor ought to be *fine* at the time of bottling. If not so at the critical time, the common force of eggs or isinglass is made use of.

It ought likewise to be bottled in cool weather ; otherwise the bottles are more liable to fly.

Good cider should be kept as wine\* ; and, as this, may be kept to almost any age ; the several *species* of FRUIT LIQUOR being very similar in their nature †.

VIII. MARKETS. The principal market for fruit liquor, is LONDON ; from whence, as well as from BRISTOL, it is sent to the EAST and WEST INDIES, and other FOREIGN MARKETS, in bottles ‡. But

\* Cider, which has been sweetened, with Lisbon sugar, by the London dealers, to suit the palates of their customers, is apt to fly. The bottles, therefore, in *this* case, should be kept upright. Also, when the liquor, tho' genuine, is bottled at an early age, the bottles, in the first instance at least, ought not to be laid down.

† A Gentleman, near Ledbury, is said to have cider of every fruitage, for more than 20 years past.

‡ For FOREIGN MARKETS, fruit liquors should not be bottled, until they have acquired some considerable age ;



But the quantity of liquor sent abroad is in considerable, compared with that expended in the HOME-CONSUMPTION: not only London and Bristol, but every town of this island (as well IRELAND) is supplied from this quarter of it; in which, only, *sale* liquor is at present produced, in quantity.

The immediate PURCHASERS are chiefly *dealers*, who live in different parts of the district, and who supply the inland markets. UPTON and LEDBURY are the principal places of residence of what are provincially termed "cidermen"; but HEREFORD, GLOUCESTER, and WORCESTER have their buyers. Bristol, too, sends buyers into the country; and, of late years, the London dealers have found their way into it; and, in a plentiful year, buy up great quantities.

The STATE, in which orchardmen dispose of the produce of their grounds and orchards, is various:

Sometimes

as, otherwise, they are liable to burst the bottles; much loss having been frequently sustained by injudicious management, in this case. The length of time, they ought to lie in cask, previous to shipping, depends on the length of the voyage, and the climate it is intended for.

Sometimes the fruit is sold.

Sometimes the liquor immediately from the prefs.

Sometimes the liquor after the first racking.

Sometimes the liquor fit for market, in casks.

Sometimes (but not often) the liquor in bottles.

The growers, in general, object to selling the FRUIT:—the quantity of carriage is increased;—they lose the washing of the “must” for family liquor;—and the dealers say they have other reasons;—they cannot change the fruit, nor, in a scarce year, dilute or adulterate the liquor. Nevertheless, considerable quantities of fruit (especially of the superior sorts of apples) are sold: the dealers, who have conveniency and skill, like to manufacture their own liquor, from the beginning: or, if this cannot be accomplished, to send a person to see it properly made.

The principal part of the LIQUOR is bought immediately from the prefs; the country dealers, in general, choosing to have the working, at least, if they cannot have the making, of their own liquors.—And, in a general light, this is, *at present*, eligible: for,  
having

having proper conveniency, as well as skill, or proper persons, to give the business of fermenting due attendance, the risque of manufacture is lessened: besides their having, by this means, an opportunity of suiting the taste (be it true or false) of their customers. The London and Bristol dealers, have places in the country, where they work their own liquors: the former chiefly at Upton; the latter at Hereford.

The PRICES of orchard produce are very fluctuating; varying with the quantity produced, and the quantity of stock in hand. The prices of hops are not more uncertain than those of fruit liquors. One night's frost, in the spring, has been known to raise the speculating price three-fold of what it was the preceding day.

*The price of fruit.* In the "great hit" of 1784, common apples were sold at 18d. to 2s. a fack (of four corn bushels)\*. Stire apples

\* FRUIT MEASURE. This is as vague, here, as it is in other places. The dealers generally buy by the "seam" a kind of indeterminate measure; or by the "bushel"; containing two "bushel-baskets", holding more than a

ples 5s. to 12s. a sack; according to the soil, and situation produced in. In 1786; a very scarce year, common apples were mostly sold to the fruit boats, for the Bristol market. Stire 10s to 18s. a bag. This year; another hit of unusually fine fruit; common apples 18d. to 2s. Stire 6s. to 14s. a bag. The former the price in the vale; the latter in the forest!

*Price of liquor from the press.* That of *common cider* is generally fixt by a meeting of the dealers, at Hereford fair, the 20 October. In 1784, they injudiciously (as has been intimated) fixt it too low; namely 14s. the hog-head (of 110 gallons)\*: the consequence was

corn bushel each. But by a *bushel*, in common language, is generally meant *two corn bushels* (of  $9\frac{1}{2}$  or 10 gallons) *level*: the *sack*—provincially “bag”—being reckoned *two “bushels.”*

† FRUIT LIQUOR HOGSHEAD. By a hoghead is understood 110 gallons. But hogheads in general do not run exactly to that measure; varying from 105 to 115 gallons, wine measure.

They are made very substantially, with oak staves and heads, with very strong ashen hoops, and generally with four, or a greater number of iron hoops.

The price of such a cask varies with the demand. The ordinary price is a guinea. This year, the coopers taking the

was, farmers would not sell, and of course could not make (not having casks to hold the whole of their liquor). Some sharp frosts set in, the principal part of the best fruit was entirely spoilt, or materially injured; and the dealers, before the making season was over, were glad to give 25s. a hogshead. In 1786, the dealer's price was five guineas a hogshead: a rare price. This year they have again fixt it unreasonably low: namely 16s. a hogshead. The ordinary price of common cider, on *a par of years*, is 25s. to two guineas a hogshead.

*Stire cider* is seldom sold from the prefs; either the dealers buy the fruit, or the growers work their own liquor. Its *value* at the prefs is 5l. to 15l. a hogshead: a price, which the finest wines are not worth, I believe, in any country, immediately from the prefs.

*Common perry* has, it is said, this year, been sold at a guinea a load of three hogsheads!—

Not

the advantage of the season, have raised them to a guinea and a half: so that the cask is worth nearly twice as much as the liquor it can contain.

When liquor is sent in to the dealers, they draw it off, and return the casks, by the team which brought them.

VOL II.

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Not a penny a gallon.\* Half a guinea to 12s. is the ordinary price. Fifteen shillings is esteemed a high price for common perry.

Nevertheless "*squash-pear perry*" is seldom sold so low as two guineas. It has been sold at 12l. 10s. from the press! The ordinary price is 5l. 10s. a hoghead. This year the price at the beginning of the season was five guineas: considerable quantities—probably some hundred hogheads—were bought at four guineas. But, before the close of the season, the current price was two guineas. A price, which has seldom been known before. A farmer had four guineas bade for his whole make (from thirty to forty hogheads); but he refused to sell under a shilling a gallon. The same dealer has since bought a considerable part of it, at two guineas a hoghead†.

*The*

\* In this case, however, it is to be supposed, that the carriage is very short; or the liquor is delivered at the press.

† The EXPENCE of picking, carriage of fruits, hoarding, grinding and pressing, is from three to five shillings a hoghead; according to the labour bestowed, and of course the quantity made in a day. It cannot be made properly under 5s. a hoghead. The price of making at one public mill

*The price of liquor once racked* is about one fourth more than the price from the prefs. Liquor in this state is bought, chiefly, by housekeepers, in towns, (and perhaps innkeepers) who have neither conveniency nor skill to rack. The one racking being generally the whole that it receives\*.

*The price of fermented liquor* varies much, according to the species of fruit it is made from. *Common cider and perry* (provided the general market prices remain nearly the same) are worth about one half more than their prices at the prefs; more or less, however, according to their prefs prices †.

The

mill (at Rofs) is a shilling a hoghead for the mill only, the employer finding the horse. At another, (in Newnham) the price of the mill and a horse is three shillings a day. The expence of carriage depends on the distance. Four hogheads are a full load. The carriage may be laid at two to five shillings a hoghead. With the wear and tear of casks and other utensils, the medial expence on liquor, sent in from the prefs, may be estimated at seven shillings a hoghead.

\* In this case, the farmer sometimes lends his cask to the buyer, charging about five shillings for the loan.

† When liquor is sold in this state, the seller's casks remain with the purchaser, free of cost, until they be emptied; though the liquor should remain in them two or three years.

The *risque*, in ordinary hands, is something considerable. The more delicate liquors, as *fire cider* and *squash perry*, which require great judgement in fermenting, and which (the last more particularly) frequently turn out contrary to expectation, notwithstanding extraordinary care and skill may have been bestowed upon them, are sometimes sold at a very advanced price, presently after laying up. In this recent state, each species has been sold so high as 20 guineas a hoghead. Their par price in that state is 10 to 12 guineas.

*The price in bottles.* When we consider the very low price, at which fruit liquors are sold, in their recent state, and still more, when we reflect on the many hundred hogheads, which are frequently wasted for want of casks to put it in\*, we become astonished at the extravagant rate, at which they are sold, in their matured state; even in the very center of the district, in which they are produced; especially in bottles. The common price at the inns is a shilling a bottle

\* In 1784 cisterns were formed in the ground to receive it; but they did not answer expectation; the liquor was spoilt. In Pershore the juice is said to have run from the pear-hoards, in currents, into the common shores.



bottle\*! While the ordinary price of draught cider (of perhaps a better quality) is four pence a quart—seldom more than six pence (the London prices!) But the liquor which is put into bottles is *supposed*, at least, to be of the higher finer kinds; as fire, and golden pippin cider, and squash perry. Squash perry, if any way curious, is sold commonly at 18d. a bottle. It has (as well as cider) been sold at 2s. a bottle.

IX. PRODUCE. This may be viewed in a five-fold light.

The produce of fruit

The produce of trees

The produce of ground

The produce of individuals

The produce of the district.

THE PRODUCE OF FRUIT depends much on the *species* of fruit, as well as the *season* it is matured

\* The excise on cider, which passes through the dealer's, or the publican's hands, is about eighteen shillings and six pence the wine hoghead; or about three pence halfpenny the wine gallon.

The dealer's price, for common liquors, is eight to ten shillings a dozen; for finer liquors, ten to eighteen shillings; with bottles included.

tured in. Pears, in general, yield much more juice than apples. And some species of apples much more than others. The general estimation is eight bags of apples, or six bags of pears, to a hogshhead of liquor. Of the latter, supposing each bag to contain thirty six gallons, and the hogshhead one hundred and eight gallons, two hogshheads of fruit yield one hogshhead of liquor. Hence some sorts of apples, as the Hagloe crab and the fire, in some dry seasons, will require near three hogshheads, or any other measure, of fruit to one of liquor.

THE PRODUCE OF TREES is extraordinary; evincing, in a striking manner, the fertility of the soil of this country. I was shewn a *pear* tree, off which *two* hogshheads were made this year; and in the same suite of grounds was an apple tree, from which the same quantity was *expected* to be drawn. But this, supposing the expectation to be fulfilled, is a rare instance, I believe. *One* hogshhead of *cider*, I understand, is reckoned a great produce: three barrels a very great yield for one tree. But *three* hogshheads of *perry* were, *it is said*, this year produced by one pear tree!

But

But fruit, this year, is not only large and thickly hung upon the trees, but yields an unusual proportion of juice; which is nevertheless esteemed to be of a good quality.

THE PRODUCE OF GROUND. I have been informed, and by an authority which I have no reason to doubt, that twenty hogheads have been made from an acre of ground;—a close orchard. This is not improbable; for it appears, above, that forty trees may stand tolerably well on an acre of ground: so that the produce, in this case, is only half a hoghead each tree.

THE PRODUCE OF INDIVIDUALS, in a plentiful year, runs very high. This year, there are several men, who will make between two and three hundred hogheads. I am assured by a person, who ought to be a judge of the subject, that there are some few individuals, who will, this year, make five hundred hogheads of liquor; including cider, perry, and their own family drink. This is the less incredible, when we consider that there are individual plantations—single orchards—in Herefordshire, of thirty to forty acres each.

It is from these larger plantations that the markets are principally supplied. Farmers, in general, have seldom more fruit than will supply their own enormous drink houses.

It is observable, however, that cottagers, from incroachments made from commons and larger wastes (paying perhaps the Lord of the Manor a small quit-rent) thrown in, collectively, no inconsiderable quantity of liquor. Some of them making perhaps in a plentiful year, eight or ten hogsheads; and having no thirsty work people to quench, the principal part of it goes of course to market.

THE PRODUCE OF THE COUNTRY, in a fruit year, must be immense. Far exceeding the general conception. The produce of the four counties (of Gloucester, Monmouth, Hereford, and Worcester) which has passed through the dealer's hands, has been estimated at fifteen thousand hogsheads. And a quantity superior to that is, in a plentiful year, probably consumed within the district. The produce of the four counties, on a par of years, may therefore be laid at thirty thousand hogsheads.

GENERAL

GENERAL OBSERVATIONS ON FRUIT LIQUOR AS AN OBJECT OF RURAL ECONOMY. Notwithstanding the extraordinary produce of fruit, which this country affords, in a plentiful year, it is a disputable point; especially between landlord and tenant; whether, upon the whole, the liquor it yields be a good, or an evil. This is a matter, which would be difficult to determine, demonstrably.—I am inclined to believe, from what I have seen, that, every thing considered, it is, *under present circumstances*, the latter.

The damage done to the crops, by the drip and shade of the trees, is annual, certain, and, *at present*, excessive. Whereas a general hit of fruit is most uncertain;—is not expected oftener than every third year. This is the fourth year from the last general fruitage. Many trees, during this interval, not having, perhaps, matured an apple: while this year, though the produce be abundant, the price is so low, that it little more than pays for labour, carriage, and attention: yet the neat profits of this year, small as they may be, have to stand against the damage of four years; also against a proportionate share of the cost of plants, planting

planting, grafting, and defending the young trees; of the mill-house, and apparatus; of the wear and tear of casks, and of cellar room; as well as against the evils of a habit of drinking; which, in a fruit year, is the cause of much idleness; and, in a dearth of fruit, is the cause of an unnecessary waste of malt liquor; which, also, the neat profit of the fruit year, has to stand against.

Nevertheless, it is sufficiently evident, from data interspersed in the foregoing pages, though difficult to *prove*, that youthful, bearing trees, even of the common sorts of fruit, and under their present neglect, produce, on a par of years, more than will repay their several encumbrances; and that the more valuable kinds are very advantageous to their occupiers.

THE EFFECT OF FRUIT TREES ON THE GROUNDS THEY GROW IN, depends much on the distance they are planted from each other; as well as on the width of their heads, and the height of these from the ground. Low-spreading trees, planted in close order; especially if full of wood; are ruinous to the crops, which are under them: drawing up corn  
weak

weak and spiritless; and, by destroying or checking the better herbage, give grafs what is called a fourness; entirely changing the quality of the herbage. On the contrary, tall-stemmed lofty trees, kept within due bounds, thin of wood, and standing at suitable distances, will admit of corn growing beneath them; especially while young; and, under these circumstances, are much less injurious to grafs (except in autumn with their leaves) than reason may suggest. Beside, an advocate for fruit grounds might argue, that the trees feed, in part at least, below the corn mould, or vegetative stratum; so that the husbandman might be said to be reaping two crops, at the same time, from the same land: one the produce of the soil; the other of the substratum; whose treasures, without the trees, would be lost to him. There is probably some truth in this idea.

Upon the whole, I think, we may fairly conclude, that, by encreasing the better fruits, and, by pursuing proper management throughout, the fruit grounds and orchards of these counties, might be rendered a source of riches to them; and, at the same time, be a benefit to the nation at large. The

The particulars of improvement requisite to the acquisition of these advantages appear to be the following.

1. To clear the ground of such old and diseased trees as encumber the soil, without making an adequate return ; due attention being paid, in this case, to the more valuable kinds of fruit. By this means, it is probable, the soil might be relieved from one fourth of its present encumbrance.

2. To clear away, while the wood remains of value, or to head down and graft with the better fruits, the wildings, kernels, and other inferior kinds of fruit, which encumber the ground, and crowd better trees ; and which, by affording an inferior kind of liquor, bring disrepute on the whole. By this means much more than one fourth of the present encumbrance would be got rid of, without eventual injury ; *or* the ground would become productive of a species of produce, which would, in a short time, be beneficial to the occupier and the community.

3. To set up the low-headed, drooping trees, which remain ; thereby giving air to the crops growing beneath them ; and to free  
the



the tops from all foulness and superfluity; thereby giving health and vigour to the trees; and, by lessening the darkness of their shadows, at the same time give health and vigour to the crops: as well as by lessening the quantity of bearing wood, guard, as much perhaps as human art can guard, against an excess of fruit, in any one year; thereby doing as much perhaps as can be done, towards obtaining, what of all things is desirable to a fruit farmer, a crop of fruit every year\*. But, as there is no hope of obtaining this with full effect;

#### 4. To

\* PRUNING. The great danger to be guarded against in pruning fruit trees is that of *doing too much at once*. Taking away a large proportion of the top of a fruit tree injures, in all probability, its roots, eventually, by rendering part of them useless; and the top, in the first instance, by a glut of sap. On the contrary, taking away a small proportion of the top, in equal probability, strengthens the roots; by enabling them to supply, with greater ease, the wood and foliage, that are left; as well as to throw out a stronger blossom, and mature, with greater certainty, the fruit which succeeds.

Hence, the pruning of an orchard, whose trees are in a wild thick-wooded state, ought to be made the work of three or four years: removing, the first year, the most offensive boughs, only. Thus rendering the work progressive and pleasurable; in as much as it becomes, by these means, light, yet most effectual.

4. To erect, on the larger plantations at least, suitable buildings, proportioned to the quantity of planting; for the purpose of manufacturing, on the premises, the liquors they respectively produce.\* Suffering dealers, from all quarters of the kingdom, to impose, in open convocation, what prices they please, in a plentiful year, is disgraceful to the country. Instead of fourteen or fifteen shillings a hog-head, a grower might ensure with moral certainty, by keeping his liquors, perhaps, only one year, three times, perhaps four times, that price—perhaps ten times the *neat* profit which he now receives. It would be worth the tenants' while to pay doubly the interest laid out on such erections. To suffer the dealers from London, and other distant markets, to send agents into their neighbourhood, and make this profit out of them, perhaps within sight of their plantations, is an absurdity, which ought not to escape censure. The landed interest of the district is involved in the discredit.†

5. To

\* See note page 351 ; and page 323.

† The country dealers are likewise involved in the disgrace: to suffer men, whom, in the regular course of business

5. To endeavour, by every deviseable means, to propagate, in fuitable soils, and well chosen situations, the "OLD FRUITS;"—which, if they can, by any art yet known, or by any, which study and application may hit upon, be continued only one *generation* longer, the advantage might, in my opinion, be of considerable magnitude.\*

## 6. To

business, *they* ought to *supply*, to manufacture their own liquors in the place of their growth, is at once a disgrace and a disadvantage to them.

\* PROPAGATION OF THE OLD FRUITS. The fire apple, *it is said*, is propagated with tolerable success, upon the Forest of Dean (its favorite soil) by *suckers*; or rather young wood pulled out of the crown of the tree; in the same manner as the codlin is usually propagated. *Layering*, in tubs of earth elevated for that purpose, might be a still better mode of propagation.

The squash pear has been *budded*; but with what degree of success is yet to be tried.

The golden pippin, *it is said*, is raised, with success, by attending properly to its head, while young; preventing it from running too much to wood; keeping it within due bounds, by judicious *pruning*; especially by taking off the *midsummer shoots*; which not only exhaust the sap, and thereby weaken the tree in the instant; but being tender, are liable to be frost-nipped; decay; rot off; and leave a wound in the young branch which threw it out.

Be this as it may, nothing is more likely to keep the young trees in health, and preserve them from the CANKER,  
which

6. To set about, with all speed, the raising of FRESH VARIETIES: for although it seems possible that, by proper exertions of art, the old fruits may be kept in being some short time longer, it appears, in my mind, impossible that they can, by any art, be rendered perpetual. Besides, the old varieties are, indisputably, the productions of human industry: and it is highly probable, that by greater exertion, or by greater success, new varieties of still higher value may be produced.

A reform of this magnitude, however, must not, for various reasons, be expected from the

which is so fatal to the old fruits, than keeping the head within due bounds; thereby enabling the roots to give vigour to the whole plant.

I have been informed, however, by a Gentleman, who, for amusement, prunes his own wall trees, that *nicking the bark*, by drawing the edge of a sharp knife carefully down it, will, by giving freedom to the sap vessels, stop the CANKER; and I was shown trees, on which its effects was sufficiently striking to warrant my mentioning it in this place.

The reader, however, is requested to receive the above particulars as *hints*, which being in possession of, without having either leisure or opportunity to enable me to establish the proof of their practicability, I deliver up to the use of those, who, being in practice, may have both.

the *tenantry*. Fruit trees, as an object of rural economy, class with woodlands and hedges: they are *fixtures* belonging to the premises.—The tenant has only the use of them, perhaps for a time uncertain. His object, of course, is present profit. It, therefore, behoves the proprietor, who has a permanent interest in them, to look forward to future advantages.

The great objects of the reform would be, to free the estate from unprofitable encumbrances. To stop the efflux of inferior liquors; which, by finding their way to market, bring general discredit on ENGLISH FRUIT LIQUORS: and, above all, to encrease the quantity of liquors of the *first quality*; that their richness, their flavor, and their generous disposition may be universally known;—that the demand may be in consequence enlarged; the prices be raised; the value of estates augmented; and the prosperity of these counties proportionally encreased.

THE END OF THE SECOND VOLUME.

VOL II.

D d

INDEX.



# I N D E X.

A.

**A CORNS**, observations  
on, ii. [138](#).

Aftergrafs, vale of Gloucester,  
[i. 204](#).

Aftermanagement of orch-  
ards, ii. [285](#).

Age of fruit trees, ii. [301](#).

Alchouses, few in the vale  
of Gloucester, [i. 15](#).

Alney, Isle of, observations  
on, [i. 175](#).

Ancient privileges hurtful to  
modern husbandry, [i. 198](#).

Annotta, its description, [i. 290](#).

—, further observations  
ii. [112](#).

Apples for cider, ii. [251](#).

—, their nature, ii. [244](#).

Arable crops, vale of Glo-  
cester, [i. 62](#).

— management, vale of  
Gloucester, [i. 63](#).

Aspect of orchards, ii. [259](#).

B.

Barley, vale of Glo. [i. 132](#).

Barley, used as a cleansing  
crop, [i. 132](#).

Barley, Cotswolds, ii. [58](#).

Barns, v. of Glo. [i. 37](#).

—, Cotswolds, ii. [19](#).

Barn floor, singular method  
of making, ii. [19](#).

Barn floors vale of Glo: [i. 38](#)

— man. vale of Glo. [i. 103](#)

— man. Cotswolds, ii. [49](#).

Barton fair described, [i. 314](#).

Beans, vale of Glo. [i. 142](#).

Beasts of labour, vale of Glo.  
[i. 54](#).

—, Cotswold, ii.

29.

Blight of fruit trees, ii. [295](#).

Bottling fruit liquors, ii. [378](#)

Braids, their use described,  
ii. [283](#).

Breaking up grafsland, vale  
of Gloucester, [i. 67](#).

—, Cotswolds, ii. [38](#)

Breast plowing, Cotswolds,  
ii. [39](#).

Buildings, vale of Gloucester,  
[i. 30](#).

—, Cotswolds, ii. [16](#).

Bullock sheds, vale of Glo-  
cester, [i. 250](#).

—, Cotswolds ii. [76](#).

Butter, from milk, vale of  
Gloucester, [i. 274](#).

Buttermaking, vale of Glo-  
cester, [i. 275](#).

Butter from whey, vale of  
Gloucester, [i. 315](#).

— from whey, vale of  
Berkeley, ii. [136](#).

— guage, proposed, [i. 282](#).

D d 2

Calves

# I N D E X .

- C.
- Calves, rearing, vale of Gloucester, [i. 223.](#)  
 ———, fattening, vale of Gloucester, [i. 273](#)  
 ———, fattening, North Wiltshire, ii. [160](#)  
 Calf stags, [i. 225](#)  
 ——— stalls, North Wiltshire, ii. [160](#)  
 Cart horses, price of, [i. 207](#)  
 Catalogue of corn weeds, [i. 92.](#)  
 ——— of lowland herbs, [i. 177.](#)  
 ——— of middleland herbs [i. 183](#)  
 Cattle, vale of Gloucester, [i. 211](#)  
 ———, Gloucestershire breed described, [i. 213](#)  
 ———, Cotswolds, ii. [75.](#)  
 ———, Herefordshire, ii. [226](#)  
 ———, comparison between the longhorned, and middlehorned, ii. [227](#)  
 Cement, singular preparation of, Cotswolds, ii. [18](#)  
 Change of management recommended, vale of Gloucester, [i. 130](#)  
 Characteristic of farms, vale of Gloucester, [i. 48](#)  
 Cheefe, vale of Glo. [i. 286](#)  
 ———, vale of Berkeley, ii. [108](#)  
 ———, North Wilts. ii. [161](#)  
 ———, gen. obs. ii. [218](#)  
 ———, species of, general observations, ii. [183](#)  
 ———, species of, vale of Berkeley, ii. [108](#)  
 ———, species of, North Wiltshire, ii. [161](#)  
 Cheefes in the presis, vale of Gloucester, [i. 308](#)  
 ———, vale of Berkeley, ii. [122](#)  
 ———, North Wiltshire, ii. [177](#)  
 ——— on the shelves, vale of Gloucester, [i. 310](#)  
 ———, vale of Berkeley, ii. [124](#)  
 ———, North Wiltshire, ii. [177](#)  
 ——— on the floor, vale of Gloucester, [i. 311](#)  
 ———, vale of Berkeley, ii. [129](#)  
 ———, North Wiltshire, ii. [179](#)  
 Cheefe, criterion of excellency, ii. [188](#)  
 ———, defects of, ii. [188](#)  
 ———, experiments on, ii. [192](#)  
 ——— net, ii. [218](#)  
 ——— presis, vale of Gloucester, [i. 271](#)  
 ———, vale of Berkeley, ii. [122](#)  
 ———, North Wiltshire, ii. [158](#)  
 ———, the probable causes of heaving, ii. [201](#)  
 ——— produce of vale of Berkeley, ii. [131](#)  
 ———, produce of, North Wiltshire, ii. [181](#)  
 ———, qualities of, ii. [187](#)  
 ——— rooms, an eligible arrangement of, ii. [179](#)  
 ———, sage, to make, [i. 309](#)  
 Cider, the immoderate quantities drank, [i. 52](#)  
 ———, to make, ii. [303](#)  
 ——— apples ii. [257](#)  
 Cider,



# I N D E X.

- Cider prefs described, ii. [312](#)  
 — a perfect engine, ii. [344](#)  
 — mill described, ii. [308](#)  
 —, its imperfections, ii. [333](#)  
 Cleaning cheefes, vale of Gloucester, i. [310](#)  
 —, vale of Berkeley, ii. [125](#)  
 —, North Wiltshire, ii. [178](#)  
 Clearing grafsland, vale of Gloucester, i. [191](#)  
 Clover, vale of Gloucester, i. [154](#)  
 —, Cotswold, ii. [74](#)  
 Coagulation of cheefe, gen. obf. ii. [208](#)  
 Coagulum for cheefe, gen. obf. ii. [207](#)  
 Colouring cheefe, vale of Gloucester, i. [289](#)  
 —, vale of Berkeley, ii. [109](#)  
 —, North Wiltshire, ii. [164](#)  
 —, gen. obf. ii. [110](#)  
 — cider, ii. [372](#)  
 Common field, i. [16](#)  
 — meadows, i. [170](#)  
 — pastures, i. [170](#)  
 — shores, vale of Gloucester, i. [12](#)  
 — wood, an instance of, i. [44](#)  
 Corn weeds, vale of Gloucester, i. [91](#)  
 Correcting fruit liquors, ii. [370](#)  
 Courie of husbandry, vale of Gloucester, i. [64](#)  
 —, Cotswolds, ii. [37](#)  
 Covenants, vale of Gloucester, i. [21](#)  
 —, Cotswolds, ii. [16](#)  
 Cows, vale of Gloucester, i. [215](#)  
 —, Cotswolds, ii. [75](#)  
 —, vale of Berkley, ii. [98](#)  
 —, North Wilts, ii. [151](#)  
 Cotswold hills described, ii. [1](#)  
 Cotting Ryeland ſheep, ii. [234](#)  
 Cultivated graſſes, vale of Gloucester, i. [154](#)  
 — herbage, Cotswold, ii. [63](#)  
 Curd, vale of Gloucester, i. [300](#)  
 —, vale of Berkeley, ii. [117](#)  
 —, North Wilts, ii. [167](#)  
 —, gen. obf. ii. [210](#)  
 D.  
 Dairy man. vale of Gloucester, i. [262](#)  
 — vale of Berkeley, ii. [103](#)  
 — North Wilts, ii. [155](#)  
 —, gen. obf. ii. [183](#)  
 — room, vale of Gloucester, i. [265](#)  
 —, vale of Berkeley, ii. [124](#)  
 —, North Wiltshire, ii. [157](#)  
 Dairy utenſils, vale of Gloucester, i. [266](#)  
 —, North Wilts, ii. [158](#)  
 Dairywomen, vale of Gloucester, i. [263](#)  
 —, vale of Berkeley, ii. [104](#)  
 —, North Wilts, ii. [155](#)  
 Defending fruit ſtocks, ii. [277](#)  
 D d 3      Dimensions

# I N D E X.

- Dimensions of a Gloucestershire cow, [i. 216](#)  
 Districts of Gloucestersh. [i. 6](#)  
 Ditches neglected, vale of Gloucester, [i. 40](#)  
 Draining, vale of Gloucester, [i. 190](#)  
 Drinking, abuse of, [i. 52](#)  
 ——— pools, Cotswolds, [ii. 21](#)  
 ——— pools, vale of Berkeley, [ii. 93](#)  
 Dung, instance of singular effect, [ii. 47](#)  
     E.  
 Eating off wheat, in autumn, [ii. 53](#)  
 Embankment of Severn, [i. 12](#)  
 Enemies of fruit trees, [ii. 289](#)  
 Essential oil, [ii. 195](#)  
 Estates, vale of Glo. [i. 19](#)  
 ———, Cotswolds, [ii. 12](#)  
 ———, &c. vale of Berkeley, [ii. 89](#)  
 ———, North Wilts, [ii. 143](#)  
 ———, on laying out, [i. 46](#)  
 Every years' land, [i. 65](#)  
 Evelham vale described, [i. 9](#)  
 Excess of fruit, [ii. 296](#)  
 Expence of fruit liquor, [ii. 386](#)  
 Experiments on lime, [i. 33](#)  
 ——— on cheese, [ii. 192](#)  
     F.  
 Fairsteads, obsf. on, [i. 110](#)  
 Fairstead, Hereford, [ii. 232](#)  
 Fallowing much wanted vale of Gloucester, [i. 68](#)  
 ———, Cotswolds, [ii. 41](#)  
 Farms vale of Gloucester, [i. 48](#)  
 ———, Cotswolds, [ii. 27](#)  
 ———, vale of Berkeley, [ii. 90](#)  
 ———, North Wilts, [ii. 145](#)  
 Farm buildings, vale of Gloucester, [i. 30](#)  
 ———, Cotf. [ii. 16](#)  
 ———, vale of Berkeley, [ii. 92](#)  
 Farmeries, vale of Gloucester, [i. 37](#)  
 ———, Cotswolds, [ii. 18](#)  
 ———, vale of Berkeley, [ii. 92](#)  
 Farmers, vale of Glo. [i. 50](#)  
 ———, Cotswolds, [ii. 29](#)  
 Farm-houses, vale of Gloucester, [i. 55](#)  
 ———, Cotf. [ii. 33](#)  
 Farmyard man. vale of Gloucester, [i. 103](#)  
 ———, Cotf. [ii. 49](#)  
 Fattening cattle, vale of Gloucester, [i. 227](#)  
 ———, Cotf. [ii. 76](#)  
 Fences, vale of Gloucester, [i. 40](#)  
 Fence walls, Cotf. [ii. 24](#)  
 Fermenting fruit liquor, [ii. 349](#)  
 ——— room, [ii. 351](#)  
 ———, general observations on, [ii. 361](#)  
 Field fences, vale of Gloucester, [i. 40](#)  
 ———, Cotf. [ii. 23](#)  
 Filtering, [ii. 356](#)  
 Flax seed, as an article of stall fattening, [i. 236](#)  
 Flooring materials, vale of Gloucester, [i. 37](#)  
 Folding off turneps, Cotswolds, [ii. 67](#)  
 ——— up hill, [ii. 62](#)  
 Form of lease, vale of Gloucester, [i. 22](#)  
 Fruit, species of, [ii. 243](#)  
 ———, its management, [ii. 316](#)  
 ———, on grinding, [ii. 329](#)  
 ——— liquor, [ii. 303](#)  
     Fruit

# I N D E X.

- Fruit liquor species of, ii. [303](#)  
 — liquor prefs, ii. [312](#)  
 — liquor considered as an  
   object of rural economy  
 — lofts, ii. [323](#)  
 — measures, ii. [383](#)  
 — mill, ii. [308](#)  
 — trees, as a crop in huf-  
   bandry, ii. [302](#)  
   G.
- Gates, vale of Gloucester,  
   i. [41](#)  
 Gathering fruit, ii. [316](#)  
 Gen. obf. on dairy manage-  
   ment, ii. [183](#)  
 Generous cider, to produce,  
   ii. [368](#)  
 Gloucestershire divided into  
   districts, i. [6](#)  
 Gloucester, vale of, described,  
   i. [10](#)  
 Goat, instance of a probable  
   good effect of, ii. [33](#)  
 Grafting fruit trees, ii. [281](#)  
 Grasses, cultivated, vale of  
   Gloucester, i. [154](#)  
 —, natural, vale of Glo-  
   cester, i. [170](#)  
 Grassland, vale of Gloucester,  
   i. [170](#)  
 —, Cotswold, ii. [74](#)  
 —, breaking up, vale  
   of Gloucester, i. [67](#)  
 — man. vale of Glo-  
   cester, i. [190](#)  
 — man. vale of Ber-  
   keley, ii. [97](#)  
 — man. North Wilt-  
   shire, ii. [151](#)  
 Grazing, vale of Gloucester,  
   i. [227](#)  
 —, Cotswolds, ii. [75](#)  
 Grinding fruit for liquor, ii.  
   [329](#)
- Ground fruit, its manage-  
   ment, ii. [337](#)  
   H.
- Hackles of beans, i. [151](#)  
 Hagloe crab, ii. [252](#)  
 Hams, vale of Gloucester, i.  
   [170](#)  
 Hanging gates, vale of Glo-  
   cester, i. [41](#)  
 Harvesting, vale of Gloucester,  
   i. [101](#)  
 —, Cotswolds, ii. [48](#)  
 Hay, vale of Gloucester, i. [199](#)  
 —, a proper heat of, i. [203](#)  
 Haying, vale of Gloucester,  
   i. [201](#)  
 Hay seeds, vale of Gloucester,  
   i. [158](#)  
 Heat of hay, obf. on, i. [203](#)  
 Hedges, vale of Gloucester,  
   i. [40](#)  
 —, Cotswolds, ii. [24](#)  
 Hedgerow timber, vale of  
   Gloucester, i. [42](#)  
 Herbage of Lowlands, i. [176](#)  
 —, Middleland, i. [183](#)  
 —, &c. vale of Berke-  
   ley, ii. [94](#)  
 —, North Wilts. ii. [150](#)  
 — for cheese, gen. obf.  
   ii. [198](#)  
 Herefordshire described, ii.  
   [221](#)  
 Herefordshire cattle, ii. [226](#)  
 — oxen described,  
   i. [240](#)  
 — sheep, ii. [233](#)  
 — fair, ii. [231](#)  
 High ridges, disadvantages  
   of, i. [79](#)  
 High ridges to lower, i. [81](#)  
 Hogthead, fruit liquor, its  
   size, ii. [384](#)  
 Hoing beans, i. [146](#)  
   D d [4](#) Hoing,

# I N D E X.

- Hoing corn crops, vale of Gloucester, [i. 98](#)  
 — fallows, instance of, ii. [45](#)  
 — wheat, vale of Gloucester, [i. 118](#)  
 Horses, working, vale of Gloucester, [i. 54](#)  
 Horses, working, Cotf. ii. [32](#)  
 —, breed of, vale of Gloucester, [i. 207](#)  
 —, breeding, Cotswold, ii. [74](#)
- I.
- Implements, vale of Gloucester, [i. 57](#)  
 —, Cotswolds, ii. [35](#)  
 Inclosures, vale of Gloucester, [i. 16](#)  
 —, Cotswolds, ii. [9](#)  
 Insects, enemies of fruit trees, ii. [297](#)  
 Isle of Alney, obf. on, [i. 175](#)
- L.
- Laying out estates, reflections on, [i. 46](#)  
 Laying up fruit liquors, ii. [375](#)  
 — ridges, vale of Gloucester, [i. 75](#)  
 Lease, form of, vale of Gloucester, [i. 22](#)  
 Laying land for grass, vale of Gloucester, [i. 157](#)  
 Leys, peren. vale of Gloucester, [i. 157](#)  
 —, temp. vale of Gloucester, [i. 154](#)  
 Lime, vale of Gloucester, [i. 31](#)  
 —, as a manure, vale of Gloucester, [i. 88](#)  
 —, Cotswolds, ii. [17](#)  
 Limekilns, vale of Gloucester, [i. 35](#)
- Linseed, as an article of fattening for cattle, [i. 236](#)  
 — jelly, method of preparing, [i. 238](#)  
 — oil, as an article of fattening for cattle, [i. 237](#)  
 List of corn weeds, [i. 92](#)  
 — lowland herbs, [i. 177](#)  
 — middleland herbs, [i. 183](#)  
 — rates, vale of Gloucester, [i. 319](#)  
 —, Cotf. ii. [82](#)  
 Lowland grass, vale of Gloucester, [i. 170](#)  
 — herbs, [i. 176](#)
- M.
- Management of Estates, vale of Gloucester, [i. 20](#)  
 — Cotswolds, ii. [13](#)  
 — farms, vale of Gloucester, [i. 62](#)  
 — Cotswolds, ii. [36](#)  
 — grassland, vale of Gloucester, [i. 190](#)  
 —, vale of Berkeley, ii. [97](#)  
 —, North Wiltshire, ii. [157](#)  
 Manor Courts, Cotswolds, ii. [13](#)  
 Manures, vale of Gloucester, [i. 86](#)  
 —, Cotswolds, ii. [47](#)  
 Manuring grassland, vale of Gloucester, [i. 194](#)  
 — cowgrounds, vale of Gloucester, ii. [95](#)  
 —, North Wiltshire, ii. [149](#)  
 Markets, vale of Gloucester, [i. 105](#)  
 —, Cotswolds, ii. [50](#)  
 Market

# I N D E X.

Market places, obs. on [i. 105](#)

Marl, vale of Gloucester, [i. 88.](#)

Maturing fruit, [ii. 321](#)

Meadows, vale of Gloucester, [i. 170](#)

Middle land grafs, [i. 181](#)

Mildewed wheat, time of cutting, [ii. 54](#)

Milk butter, vale of Gloucester, [i. 274](#)

Milking, vale of Gloucester, [i. 272](#)

——, North Wiltshire, [ii. 159](#)

Mill for fruit, [ii. 308](#)

——house for fruit liquor [ii. 307](#)

Milletoe, an enemy of apple trees, [ii. 291](#)

Mixing fruits for liquor, [ii. 328](#)

Mowing, different methods of, [i. 200](#)

——grounds, man. of [i. 197](#)

Mofs, an enemy of fruit trees, [ii. 292](#)

Muft, the term defined, [ii. 338](#)

Mustards, obs. on [i. 92](#) [i. 94](#) [i. 95](#)

## N.

Natural grafses, vale of Gloucester, [i. 170](#)

——, Cotf. [ii. 24](#)

Net cheefes, [ii. 218](#)

North Wiltshire described, [ii. 140](#)

Nurfery, bufinefs of, [ii. 264](#)

## O.

Oaks, many young ones, Hereford, [ii. 224](#)

Oat, wild, obs. on [i. 93](#)

Oats, vale of Gloucester, [i. 136](#)

——, on their cultivation in the vale of Gloucester, [i. 137](#)

Objects of husbandry, vale of Gloucester, [i. 62](#)

——, Cotf-wolds, [ii. 36](#)

Oil cakes, [i. 236](#)

Orchards, [ii. 243](#)

——, planting, [ii. 270](#)

——, their aftermanagement, [ii. 285](#)

Oxen, working, vale of Gloucester, [i. 54](#)

——, Cotswold, [ii. 30](#)

——, Hereford, [ii. 230](#)

Ox stalls, vale of Gloucester, [i. 250](#)

——, Cotswolds [ii. 76](#)

## P.

Painting cheefes, vale of Berkeley, [ii. 125](#)

——, general observations, [ii. 125](#)

——, method of, [ii. 129](#)

——, North Wiltshire, [ii. 178](#)

Pasture grounds, vale of Gloucester, [i. 206](#)

Pears for perry, [ii. 256](#)

——, their nature, [ii. 244](#)

Peas, vale of Gloucester, [i. 141](#)

Perennial leys, vale of Gloucester, [i. 157](#)

Perry, [ii. 303](#)

Plan

# I N D E X.

- Plan of farms, vale of Gloucester, [i. 49](#)  
 Plantations guarded by tenants, [i. 27](#)  
 Plantations, Cotswolds, ii. [25](#)  
 Planting; vale of Glo. [i. 46](#)  
     —beans, vale of Gloucester, [i. 143](#)  
     —orchards, ii. [270](#)  
 Plants, low land, [i. 177](#)  
     —, middle land, [i. 183](#)  
 Plowing wet, obs. on, ii. [43](#)  
 Points of Herefordshire oxen for fatting, [i. 245](#)  
 Pomage, its management, ii. [338](#)  
 Pools, Cotswolds, ii. [21](#)  
     —, vale of Berkeley, ii. [93](#)  
 Prefs for fruit liquor, ii. [312](#)  
 Pressing ground fruit, ii. [340](#)  
 Principles of tillage, ii. [44](#)  
 Produce, vale of Glo. [i. 18](#)  
     —, Cotswold, ii. [11](#)  
     —, vale of Berkeley, ii. [87](#)  
     —, Herefordsh. ii. [224](#)  
 Progress of spring, 1788, [i. 59](#)  
 Propagation of the old fruits, ii. [399](#)  
 Provincialisms, vale of Gloucester, [i. 323](#)  
 Pruning fruit stocks, ii. [272](#)  
     — trees, ii. [397](#)  
 Pulse, vale of Gloucester, [i. 140](#)
- R.
- Rabbits, Cotswolds, ii. [81](#)  
 Racking fruit liquors, ii. [354](#)  
 Raising fruit stocks, ii. [264](#)
- Raygrafs, vale of Gloucester, [i. 160](#)  
     —, Cotswolds, ii. [72](#)  
 Reaping beans, [i. 150](#)  
 Rearing cattle, vale of Gloucester, [i. 232](#)  
 Receiving rents, vale of Gloucester, [i. 21](#)  
     —, Cotswolds, ii. [15](#)  
 Removals, vale of Gloucester, [i. 22](#)  
     —, observations on, [i. 29](#)  
     —, Cotswolds, ii. [15](#)  
     —, vale of Berkeley, ii. [90](#)  
 Rennets, vale of Gloucester, [i. 293](#)  
     —, vale of Berkeley, ii. [113](#)  
     —, North Wiltshire, ii. [165](#)  
 Rent, vale of Gloucester, [i. 21](#)  
     —, Cotswolds, ii. [15](#)  
     —, vale of Berkeley, ii. [89](#)  
     —, North Wiltshire, ii. [144](#)  
 Rick frames, vale of Gloucester, [i. 39](#)  
 Ridges, great height of, [i. 75](#)  
     —, origin of, [i. 77](#)  
     —, on lowering high, [i. 81](#)  
 River embankment, [i. 12](#)  
 Roads, vale of Gloucester, [i. 14](#)  
     —, Cotswolds, ii. [8](#)  
     —, Herefordshire, ii. [223](#)  
 Rodden cribs described, [i. 230](#)

Rough

# I N D E X.

- Rough cider, to produce, ii. [365](#)  
 Running milk, vale of Gloucester, [i. 295](#)  
 ———, North Wiltshire, ii. [166](#)  
 ———, vale of Berkeley, ii. [115](#)  
 ———, general obf. on, ii. [208](#)  
 Ryeland sheep, ii. [233](#)  
     *S.*  
 Sage cheese to make, [i. 309](#)  
 Saintfoin, its culture fully described, ii. [63](#)  
 Season, 1788, remarkable, [i. 59](#)  
 Season of cheesmaking, vale of Gloucester, [i. 288](#)  
 ———, vale of Berkeley, ii. [108](#)  
 ———, North Wiltshire, ii. [163](#)  
 ———, general obf. ii. [195](#)  
 Seed process, vale of Gloucester, [i. 90](#)  
 Servants, Cotswolds, ii. [29](#)  
 Setting beans, vale of Gloucester, [i. 142](#)  
 Severn embankment, [i. 12](#)  
 Severn vale described, [i. 2](#)  
 Sheaves, obf. on size of, [i. 128](#)  
 Sheep, vale of Gloucester, [i. 208](#)  
 ———, a mountain animal, [i. 208](#)  
 ———, obf. on rott of, [i. 209](#)  
 ———, Cotswolds, ii. [79](#)  
 ———, Hereford, ii. [233](#)  
 ———, Ryeland, ii. [233](#)  
 ———, a fine-wooled sort, ii. [233](#)  
 Situation of orchards, ii. [257](#)  
 Size of farms, vale of Gloucester, [i. 49](#)  
 ———, vale of Evesham, [i. 49](#)  
 Small cider, how made, ii. [345](#)  
 Spring, progress of, [i. 59](#)  
 Spring frosts enemies of fruit trees, ii. [293](#)  
 Springs uncommonly low, [i. 60](#)  
 Squash pear, ii. [256](#)  
 Sodburning, Cotswolds, ii. [39](#)  
 Soil, vale of Gloucester, [i. 13](#)  
 ———, Cotswolds, ii. [7](#)  
 ———, vale of Berkeley, ii. [86](#)  
 ———, Herefordshire, ii. [222](#)  
 ——— of orchards, ii. [262](#)  
 ——— and tillage, vale of Gloucester, [i. 66](#)  
 ——— and management, Cotswolds, ii. [38](#)  
 ———, vale of Berkeley, ii. [92](#)  
 ———, North Wiltshire, ii. [147](#)  
 Soils for cheese, gen. obf. ii. [196](#)  
 Sorting fruit by hand, ii. [326](#)  
 Sowing, gen. obf. on, [i. 90](#)  
 Sowing, time of, obf. on, [i. 116](#)  
 Stack stages, vale of Gloucester, [i. 39](#)  
 Stall fattening, vale of Gloucester, [i. 233](#)  
 ———, Cotswolds, ii. [76](#)  
 Stiles, vale of Gloucester, [i. 41](#)  
 Stire apple, ii. [251](#)  
     Stocking

# I - N D E X.

- Socking pastures, i. 206  
 Stocks for grafting, ii. 264  
 Stone troughs, a peculiar construction of, i. 253  
 Straw, on feeding with, ii. 49  
 Strawyard management, vale of Gloucester, i. 104  
 —————, Cotf. wolds, ii. 49  
 Stroudwater hills, i. 7  
 Stubble used as thatch, i. 36  
 Stumming, method of, ii. 358  
 Succession, vale of Gloucester, i. 64  
 —————, Cotswolds, ii. 37  
 Sweet cider, to produce, ii. 366  
 Swine, vale of Gloucester, i. 316  
 —————, Cotswolds, ii. 81  
 —————, vale of Berkeley, ii. 137  
 T.  
 Temporary fences, vale of Gloucester, i. 41  
 —————-leys, vale of Gloucester, i. 154  
 Tenancy, vale of Gloucester, i. 20  
 —————, Cotswolds, ii. 13  
 —————, vale of Berkeley, ii. 90  
 —————, North Wiltshire, ii. 144  
 Thatch, vale of Gloucester, i. 36  
 Tiles, knobbed plain, i. 36  
 Tillage, vale of Gloucester, i. 67  
 —————, shameful want of, vale of Gloucester, i. 68  
 —————, Cotswolds, ii. 41  
 Tillage, principles of, ii. 44  
 Timber used in building, vale of Gloucester, i. 35  
 Time of sowing, obs. on, i. 116  
 —————, gen. obs. ii. 51  
 Training fruit stocks, ii. 268  
 Trasplanting fruit stocks, ii. 266  
 Trending wool, ii. 237  
 Turneps, vale of Gloucester, i. 62  
 —————, Cotswolds, ii. 60  
 Two-year olds, vale of Gloucester, i. 227  
 U.  
 Underdraining, vale of Gloucester, i. 190  
 —————, North Wiltshire, ii. 148  
 Utensils of the dairy, vale of Gloucester, i. 266  
 —————, North Wiltshire, ii. 158  
 V.  
 Vale of Severn described, i. 2  
 Vales of Gloucester and Evesham, i. 8  
 Vale of Gloucester described, i. 10  
 —————Berkeley described, ii. 85  
 Valuing lands, hedges not a criterion, i. 40  
 Varieties, definition of, ii. 245  
 —————, of fruits, their propagation, ii. 249  
 Vegetating process, vale of Gloucester, i. 98  
 Victualing harvest men, i. 101  
 Waggon



# I N D E X.

- W.  
 Waggon, vale of Gloucester, i. 57  
 Wasps, enemies of fruit trees, ii. 297  
 Water, vale of Gloucester, i. 11  
 ———, Cotswold hills, ii. 7  
 ———, vale of Berkeley, ii. 93  
 Water, North Wiltshire, ii. 150  
 ———for cheese, general obf. ii. 197  
 Watering grasslands, not a practice of the vale of Gloucester, i. 195  
 ———, a practice of North Wiltshire, ii. 151  
 Weather, 1788, i. 60  
 Weeding grassland, vale of Gloucester, i. 193  
 Weeds of corn, vale of Gloucester, i. 91  
 Wheat, vale of Gloucester, i. 112  
 ———, all hoed, vale of Gloucester, i. 118  
 ———, low produce of, vale of Gloucester, i. 129  
 ———, Cotswolds, ii. 50  
 Whey butter, vale of Gloucester, i. 315  
 Whey butter, vale of Berkeley, ii. 136  
 Whey leads, North Wiltshire, ii. 157  
 Wild oat; obf. on, i. 93  
 Winter fattening, vale of Gloucester, i. 233  
 Withy cubs, i. 230  
 Woodiness of fruit trees, ii. 290  
 Woodlands, vale of Gloucester, i. 44  
 ———, Cotswolds, ii. 25  
 Working horses, vale of Gloucester, i. 54  
 ———, Cotswolds, ii. 32  
 Working oxen, vale of Gloucester, i. 54  
 ———, Cotswolds, ii. 30  
 ———, Hereford, ii. 230  
 Workmen, vale of Gloucester, i. 51  
 ———, Cotswolds, ii. 29  
 Y.  
 Yearling cattle, vale of Gloucester, i. 227  
 Yard fences, vale of Gloucester, i. 39  
 Yard management, vale of Gloucester, i. 104  
 ———, Cotswolds, ii. 49.

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